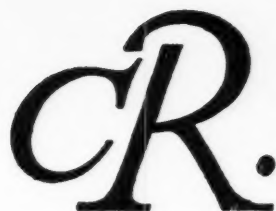


SPRING 1959



VOL. III, NO. 2

Contents

C. J. DUCASSE
What Has Science Done to Religion? 115

PETER F. DRUCKER
The New Majority 126

GEORGE BARR CARSON, JR.
Russia and American Education 143

HENRY EYRING
Scientific Creativity 159

E. H. LUCAS
The Role of Folklore in Discovery and Rediscovery
of Plant Drugs 173

ELIZABETH NITCHIE
The Language of Men 189

OSCAR MANDEL
Sources of Value in Poetry 206

LIST OF CONTRIBUTORS ii

CONTRIBUTORS

C. J. Ducasse ("What Has Science Done to Religion?") is Professor Emeritus of Philosophy at Brown University and Visiting Professor in the Department of Philosophy at New York University.

Peter F. Drucker ("The New Majority"), management consultant and writer, is also Professor of Management in the Graduate Business School at New York University.

George Barr Carson, Jr. ("Russia and American Education") is Director of the Service Center for Teachers of History of the American Historical Association in Washington, D. C.

Henry Eyring ("Scientific Creativity") is Dean of the Graduate School at the University of Utah.

E. H. Lucas ("The Role of Folklore in the Discovery and Rediscovery of Plant Drugs") was Professor of Horticulture at Michigan State University until his death recently.

Elizabeth Nitchie ("The Language of Men") is Professor Emeritus of English at Goucher College.

Oscar Mandel ("Sources of Value in Poetry") is Professor of Comparative Literature at the University of Nebraska.

With this issue of THE CENTENNIAL REVIEW, Professor Branford P. Millar leaves Michigan State University and the editorship of THE CENTENNIAL REVIEW to become president of Portland State College in Portland, Oregon. He takes with him the sincere appreciation of the Dean, the Board of Directors, and the faculty of the College of Science and Arts for having successfully translated a concept into reality, the foundation and establishment of THE CENTENNIAL REVIEW as a viable and influential quarterly. He takes with him, too, the best wishes of all who have known him at Michigan State University. Professor Millar is succeeded in the editorship of THE CENTENNIAL REVIEW by Professor Herbert Weisinger of the Department of English.

WHAT HAS SCIENCE DONE TO RELIGION?

C. J. Ducasse

MODERN SCIENCE has no light to throw on the functions of religion in the life of man. The most that can fairly be claimed is that modern science has thrown light on what the functions of religion are not. If we desire a responsible account of the roles in human life that belong respectively to religion and to science, it is to philosophy that we must turn; for to practice or teach religion, or as the case may be, science, is one thing; and it is quite another thing to reflect upon, to analyze out, and to formulate with precision the distinctive characteristics and the functions peculiar respectively to religion and to science. The second of these two tasks is an essentially philosophical one, no matter whether the person attempting it happens to be a saint, a scientist, a sophist, or a philosopher.

In any case, if we are to reach defensible conclusions on the subject in view, it is indispensable that the conceptions of science and of religion with which we approach the question be clearer and more definite than are those commonly entertained. Also, they must be objective; that is, they must not be dictated by the claims made for science or for religion by the devotees of each, but dictated by what, as a matter of verifiable fact, each actually is and does. This means that our scrutiny of these two sacred cows must be free not only of wanton irreverence, but also of wanton reverence. Like a medical examination, it must seek only to get at the facts.

Science, knowledge, and belief. Let us, then, consider science first. The word "science" of course comes from the Latin *scientia*, which means "knowledge"; and the word "scientific," as applied to a method of inquiry, means that the method is one that yields knowledge. And knowledge—as distinguished from mere opinion, from guesses, articles of faith, snap judgments, and wishful beliefs—is belief that is based on evidence rationally sufficient to prove or to make probable that the content of the belief is true.

The content of a belief is the proposition or supposition that is believed. And believing, or accepting, or being convinced, is a psychological attitude, which is not describable but is familiar introspectively at first hand to all of us. It admits of degrees, of which the maximum is complete belief and the minimum complete disbelief. The intermediate degrees may be termed degrees of positive and of negative inclination to believe. And doubt is what we have when positive and negative inclination to believe are equal.

So much being understood, two facts of fundamental importance concerning belief must now be emphasized.

The first has to do with the distinction between causes of, and rational grounds for, belief. The fact is that belief can be and in many cases is caused in a person by occurrences or considerations that are not rational grounds for belief; that is, are not really evidence that what they cause him to believe is true rather than false. Appeals to emotion, to prejudice, to hopes or fears, to purported authority, and so on, are often psychologically more effective in causing belief, or as the case may be, disbelief, than attention to evidence would be. The beliefs so acquired are of course not knowledge but merely opinions; and, no matter how firm, are as likely to be false as to be true.

The second and equally important fact about belief is that, irrespective of whether what a person believes be actually true or false, his belief of it is anyway psychologically opera-

tive in determining his actions, his feelings, and his acceptance or rejection of other ideas.

The characteristics of scientific knowledge. So much then for belief and for the relation of knowledge to belief and to evidence. Let us turn next to the difference commonly recognized between knowledge in general and scientific knowledge. The latter is what we usually have in mind when we speak of science.

Scientific knowledge has certain highly important characteristics in addition to those possessed by all knowledge. For one, it is formulated, and with enough precision to make it exactly communicable, and to permit drawing from it remote yet rigorous inferences.

Again, the truth of the propositions that constitute the content of scientific knowledge is testable; that is, it is open to verification or confutation by any person suitably prepared and suitably situated.

Lastly, scientific knowledge is systematized; the processes by which the systematization is effected being, at various stages, observation, experimentation, generalization, construction of explanatory theories, deduction and testing of their consequences, and revision of the theories as need may then be manifest. In this way a science, as it develops, gradually approaches the form of a deductive system—with postulates and definitions at the top, theorems under, and, as bridge between these and observable facts, certain prescribed operations and criteria for deciding when a fact observed shall be accepted as being a concrete instance of what a given abstract theoretical concept defines. These operational bridges between definitions and observations have been termed variously the semantics as distinguished from the syntax of a theory; or, by Bridgman, the "text" as distinguished from the "equations;" or, by Norman Campbell, the "dictionary" as distinguished from the "hypothesis" of a theory.

In view of the prestige science now rightly enjoys, however, it is perhaps not amiss to point in passing to the sober fact that individual items of scientific knowledge are not necessarily more solid or certain than are some individual items of vulgar knowledge. For example, that I have two hands is an individual item of vulgar knowledge and is quite as certain as any item of scientific knowledge. Indeed, all the knowledge possessed by the natural sciences ultimately rests upon facts testified to only by man's direct perceptual observations. No matter how elaborate and powerful a microscope a scientist may use, his eye is ultimately what tells him what the microscope or the photograph shows. Thus, scientific knowledge is not sundered from vulgar knowledge, but is continuous with and dependent on it at certain points.

What science does for man. From the foregoing brief account of the nature of science, let us now pass to the question of the functions science performs in the life of man. The answer is not difficult and can be brief.

For the scientist personally, scientific research is an exciting pursuit, as intrinsically rewarding as is any game of one's choosing. In addition, the knowledge which the pursuit often wins has the immediate value of satisfying the curiosity of the scientist and of others, concerning the questions answered by the knowledge won. But that knowledge, besides yielding these immediate satisfactions, has in many cases enormous practical value, for it confers on man two powers. One is power to predict the future effects of some known present causes; and the other is power to make the future course of nature conform to man's desires—a power he has in so far as he knows what effects would follow from what causes and as he is able to institute, or as the case may be to prevent, those causes.

The limitations of science. But the fact is only too evident in

our days that the power which science gives man to achieve what he wills can be used to implement evil purposes as effectively as to implement good ones. Possession of it does not make man good rather than evil, or evil rather than good; but only enables him to avoid doing evil by mistake when good is what he intends; and, equally, to avoid doing good by mistake when evil is what he intends. In this sense, scientific knowledge is, in itself, wholly indifferent to good or evil. The only evils it automatically diminishes are ignorance and such helplessness as springs from it.

Another limitation of science is that the knowledge it achieves, and the power it puts into the hands of man, are always limited. There are always, and doubtless always will be, questions which science is not at the time able to answer, and occurrences which, at the time, it does not give man power to bring about or as the case may be to prevent.

Religion and belief, emotion, and action. So much then for science and for what it does and does not do for man and sometimes to man. Let us now turn to religion.

The great majority of persons in our part of the world, if asked what religion is, would probably answer that it consists in—or at least it requires—belief in, worship of, and obedience to God. But this, of course is a hopelessly parochial conception of religion since it uncritically takes monotheism for granted and therefore tacitly leaves out of account both the polytheistic and the non-theistic religions. For the purposes of the present occasion, no conception of the nature of religion is adequate that does not cover, in addition to what we may personally regard as the only true religion, also all the other religions of mankind whether monotheistic, polytheistic, pantheistic, or non-theistic; and whether they be religions of primitive peoples or of civilized ones.

Of the many attempts that have been made by scholars to define religion, some conceive the essence of it to lie in the

feeling element; others, in the element of doctrinal belief; and others in the element of ritual and of conduct. But feeling, believing, and acting are so closely interdependent psychologically that all three necessarily play essential roles in religion.

There is, however, a fact about man relatively to which the belief element in religion is basic—the fact, namely, that man, and man alone among the animals, is rational in the sense of having the capacity to act and to feel and to believe from reasons; that is, from conceptualized beliefs and conceptualized remote goals; whereas the other animals are moved only by concretely present stimuli, “drives,” and conditionings.

Man’s possession of that capacity is as much as can defensibly be meant by referring to him as “the rational animal;” for obviously, man is not rational if by this be meant that the reasons from which he acts are always “rational” in the sense of valid and wise.

Man’s conceptualized beliefs, then, are basic in his religious life as well as elsewhere, in the specific sense that they are what give meaning to his feelings and to his acts.

Religion comprehensively definable only in terms of its functions. Might we not then find present in all the religions certain identical beliefs, in terms of which a universally applicable definition of religion could be framed? This hope is quickly dashed by even a cursory examination of the many diverse and incompatible religious beliefs of mankind. A definition of religion comprehensive enough to fit them all is not possible in terms of their contents, but only in terms of certain functions which it is the essential business of religion to perform; which, when need for performance of them arises, are not performed by the other human institutions; and which very different beliefs have shown themselves capable of performing with some degree of success for

persons themselves very different.

The conception, in such terms, of the essential nature of religion, which I would propose, would therefore be as follows.

Let us agree first to mean by an "overbelief" a belief that does not have the status of knowledge but merely of faith because, in content or in degree of confidence or both, it exceeds what the available evidence, if any, rationally warrants. We can then define religion comprehensively as any set of overbeliefs—together with the observances, modes of conduct, attitudes, and feelings connected with the overbeliefs—which, in so far as operative in a person, operate to perform two important functions; one, for him personally; and the other, through him, for society.

The social function of religion. The social function is to provide motivation for the individual to behave generously or at least justly, in situations where his personal interest and the interest of society conflict, and where neither such noble impulses as he may have, nor the fear of the law or of public opinion, is strong enough to cause him to subordinate his personal interest to the greater interest of his fellows. For example, belief that noble conduct wins an eventual Heaven for those who practice it, whereas persons who behave meanly reap an eventual Hell—this belief, in so far as strong in a person, provides motivation for him to behave generously or at least justly even "in the dark"; that is, even when selfish or malicious conduct instead would remain undetected by men.

Noble behavior so motivated is, of course, only long-range prudence; and this is something different from spontaneous inclination to behave nobly. Yet, just or generous behavior, no matter how motivated, does, if it becomes habitual, tend to generate spontaneous inclinations to justice and generosity. In this indirect, derivative manner, religious

overbeliefs are capable not only of motivating socially beneficial behavior, but also of functioning in the long run as "educators of the heart" of the person who harbors them.

The personal function of religion. The direct personal function of religion, on the other hand, consists in bringing to the religious individual, in so far as he lives up to the commands of his religion, a measure of inner peace in the ups and downs of life. Deep and firm religious beliefs can bring calm in time of danger, courage in adversity, dignity in time of obloquy, strength in time of temptation to evil. Also, humility on occasions of pride, prudence in times of success, generosity in one's judgments of others, moderation and a sense of responsibility in the exercise of power.

Evidently, the overbeliefs capable of performing the social and the personal functions that have just been described can hardly be the same for the primitive savage and for the highly civilized man; for the ignorant and for the educated; for the stupid and for the acutely intelligent; or for men born and reared in radically different climates of opinion. Hence the great and felicitous diversity we find among the religious beliefs of different men, of different times, and of different places.

The efficacy of religious beliefs enhanced by their vagueness. Moreover, and fortunately, in order to perform in its believers with some degree of success the two functions of religion, a religious belief need not be true in fact, nor does it even need to be clear; for, as pointed out earlier, what influences the feelings, the judgments, and the actions of a man holding a given belief is on the one hand the intensity of his belief, and on the other what he takes the content of the belief to dictate. The vagueness of the content—when, as oftener than not, it is vague—does not lessen the influence of the belief on the believer. Rather, it shields from his sight

the contradictions and incongruities which may infect the belief and which, if it were not vague, would be too glaring to make belief possible. The religions therefore have always proceeded on the sound principle that it is not rational to treat irrational persons as it would be rational to treat them if they were rational.

For religious purposes, then, the all-important things about a given belief are, on the one hand, that it be psychologically believable by the particular persons to whom it is offered; and, on the other, that the content of the belief be of a kind that will operate in those persons in the twofold manner we have described. That is, will motivate them to curb their malicious and their selfish impulses; and will, in so far as they conduct themselves as the belief would dictate, bring them a measure of inner peace in the vicissitudes of life.

But how a given belief will operate in a given person will depend, of course, not only on the content of the belief, but also on the particular nature and character of the person who harbors the belief. Hence the actual history of religion contains not only admirable pages, but also dark and discreditable ones.

The impact of science on religion. We are now in position to consider what modern science has done to religion. The first thing to bear in mind is that some of the questions science has investigated and is today able to answer presented themselves to men's minds long before any knowledge properly so called was available concerning them. Examples would be certain questions as to the history and the nature of man, of the earth, and of the universe.

But doubt and consciousness of ignorance are uncomfortable psychological states. Hence, when man lacked the knowledge that would have removed that discomfort, he spontaneously invented historical, biological, and cosmologi-

cal myths. And since, at the time, nothing was known that would invalidate them, they got automatically accepted.

Many of these myths do not themselves have any religious function; but they get handed down from generation to generation together with, and without being distinguished from, the myths and overbeliefs that on the contrary are religiously functional. In this way, the religious value which the latter really have and which is experienced gets automatically but erroneously taken to belong also to the historical, biological, and cosmological myths with which they have become closely intertwined.

Now, what modern science has done has been to clean out and dispose of some of the myths that had no religious functions, and that only served to anaesthetize unsatisfied scientific curiosity. In the process of doing so, however, science has cultivated in man the habit of demanding evidence for the beliefs he is asked to accept; and this has led many persons to reject the religious overbeliefs simply because there was no evidence for them—even when, perhaps, there was no evidence against them either—and this in disregard altogether of the crucial fact that, whether they be true or false, the mere believing of them can have the beneficial effects I have described. That is, what the advance of scientific knowledge has done has been to throw out the baby with the bath water. This is understandable because the water was pretty dark, as well as viscous! Moreover, the baby is not yet altogether clean.

The future of religion in a scientific age. The baby, however—that is, religion as I have defined it—is in itself as capable as ever of performing for men the still much needed functions it has performed all along. Furthermore, science cannot perform them because the moments at which religion is called upon to do it are the very moments at which the powers to help himself, which science has given man up to

that time, turn out not to be sufficient for dealing with the need of the moment: That science may, for instance, discover tomorrow a cure for cancer does not give to a person whose loved one is today dying of cancer what he needs today in order to face with ulterior hope and some serenity the painful situation that confronts him. And the fact is that there are always tragic situations in which, at the time, science is not yet far enough advanced to aid the persons who, at that time, need aid.

In these cases, religion does not aid them in the manner science, if more advanced, might have aided them. That is, religion does not aid them by giving them power to bend the external situation to conform to their desire. But religion can and does aid them so to alter their own inner attitude that they can then face with some serenity, courage, and perhaps hope, the difficult situation which they cannot alter.

Of course, realization of the positive value religion can thus have, even if its overbeliefs happen to be false, will not automatically enable a person who does not have them to acquire them. It may, however, move him to put himself in situations psychologically favorable to acquisition of them. Or it may aid him to revive religious beliefs perhaps lingering shyly in him, that were made anaemic by the taunts of his rampant scientific conscience. For, so long as they have not been disproved, and are of kinds appropriate to the beneficial functions described, such overbeliefs are at least as legitimate as, and psychologically more helpful than, the overdisbeliefs that have today been induced in many persons by the influence of science.

cal myths. And since, at the time, nothing was known that would invalidate them, they got automatically accepted.

Many of these myths do not themselves have any religious function; but they get handed down from generation to generation together with, and without being distinguished from, the myths and overbeliefs that on the contrary are religiously functional. In this way, the religious value which the latter really have and which is experienced gets automatically but erroneously taken to belong also to the historical, biological, and cosmological myths with which they have become closely intertwined.

Now, what modern science has done has been to clean out and dispose of some of the myths that had no religious functions, and that only served to anaesthetize unsatisfied scientific curiosity. In the process of doing so, however, science has cultivated in man the habit of demanding evidence for the beliefs he is asked to accept; and this has led many persons to reject the religious overbeliefs simply because there was no evidence for them—even when, perhaps, there was no evidence against them either—and this in disregard altogether of the crucial fact that, whether they be true or false, the mere believing of them can have the beneficial effects I have described. That is, what the advance of scientific knowledge has done has been to throw out the baby with the bath water. This is understandable because the water was pretty dark, as well as viscous! Moreover, the baby is not yet altogether clean.

The future of religion in a scientific age. The baby, however—that is, religion as I have defined it—is in itself as capable as ever of performing for men the still much needed functions it has performed all along. Furthermore, science cannot perform them because the moments at which religion is called upon to do it are the very moments at which the powers to help himself, which science has given man up to

that time, turn out not to be sufficient for dealing with the need of the moment: That science may, for instance, discover tomorrow a cure for cancer does not give to a person whose loved one is today dying of cancer what he needs today in order to face with ulterior hope and some serenity the painful situation that confronts him. And the fact is that there are always tragic situations in which, at the time, science is not yet far enough advanced to aid the persons who, at that time, need aid.

In these cases, religion does not aid them in the manner science, if more advanced, might have aided them. That is, religion does not aid them by giving them power to bend the external situation to conform to their desire. But religion can and does aid them so to alter their own inner attitude that they can then face with some serenity, courage, and perhaps hope, the difficult situation which they cannot alter.

Of course, realization of the positive value religion can thus have, even if its overbeliefs happen to be false, will not automatically enable a person who does not have them to acquire them. It may, however, move him to put himself in situations psychologically favorable to acquisition of them. Or it may aid him to revive religious beliefs perhaps lingering shyly in him, that were made anaemic by the taunts of his rampant scientific conscience. For, so long as they have not been disproved, and are of kinds appropriate to the beneficial functions described, such overbeliefs are at least as legitimate as, and psychologically more helpful than, the overdisbeliefs that have today been induced in many persons by the influence of science.

THE NEW MAJORITY*

Peter F. Drucker

I. The Salaried Middle Class

DURING the past two or three years, professional, technical, and managerial people have become the largest group in the American working population. "Professional, technical, and managerial" is a statistical term. But it is not just a pompous circumlocution for "white-color employees." "Professional, technical, and managerial" does not include clerical people, or the sales-girl in the shop. It does not even include foremen in the factories. "Professional, technical and managerial" people, according to our definition in the United States, either determine the work of other people, or apply specialized knowledge in their own work. I know only one short term for these groups: it would be the "salaried middle class."

It is this salaried middle class that has now become our largest working group, larger in fact than the blue-collar people, the machine operators. This signals drastic changes in social structure, in the American economy, and in American politics. Thirteen years ago, when we came out of the second world war, the industrial workers were clearly still the largest single group in the American working population—almost one out of every four belonged to it. This was the end of a long historical process that went back to the early years of the 19th century when manufacturing industries were first started on American soil, a process that began to gather momentum

* This article is composed of two lectures broadcast on the Third Programme of the British Broadcasting Corporation, and published in the October 23 and 30, 1958, issues of the B.B.C. publication *The Listener*. Copyright by Peter F. Drucker, 1958; reprinted by permission.

in the early years of our century, and that brought about the great changes within the last generation: the change in domestic politics that expressed itself in the New Deal, and the change internationally that led to the emergence of the United States as the greatest industrial and military power in the West. At the end of the war, the professional, technical, and managerial group was already a sizeable group; and it had been growing fast for some time. But it was still one of the smaller groups in the working population, not much more than half the size of the blue-collar workers, that is of industrial labor, and smaller even than office and service employees or farmers. In those thirteen years industrial production in the United States has almost doubled. Both total and working population have been growing fast. But the manual labor needed for this output of goods has remained the same. The number of salaried middle-class people, however, which the economy now requires and which now are employed has almost doubled: it has grown by two-thirds and is growing much faster than either total or working population. By now, one out of every five people at work in the United States works as a professional man, as a technician, or in some managerial capacity—some 13 million of them altogether.

More important than numbers is the direction of the development. All signs point to a further growth of this group, perhaps even a faster growth. By 1975—only seventeen years away—we expect our total production in the United States to be about twice what it is now. Our working population should be one-third larger than it is today. But the only group of employees which will have to grow much faster—a great deal faster than either total population or working population—will again be the salaried middle class. Seventeen years from now, when the boys and girls who are starting their first years in school will have finished their education, in 1975, we should have twice as many people in the salaried middle class as we have today. By then they should

be almost two-fifths of the total working force. While there will be a real and continuing need for more highly skilled manual workers, we shall not be needing many more of the "typical" industrial workers, the semi-skilled machine operators, the men who work on the assembly lines or in the steel mills. Indeed, the three industries in the American economy where employment is likely to grow the fastest are education, electronics, and chemistry—and all three employ primarily highly educated middle-class people rather than machine operators.

Already the machine operators represent the past rather than the future. Twenty-five years ago they were by and large the youngest group in our working population. Perhaps the only exception were office personnel where there are so many young unmarried women. Shop stewards in the plants, for instance, in those days, during the great wave of unionization in the 'thirties, tended to be ten or fifteen years younger on average than the management people they dealt with. Today the industrial worker in the United States tends to be older than the population in general. Union leaders today are almost without exception older by ten years or so than their negotiating partners in management. The typical industrial worker, the machine operator, belongs to what is both a stagnant and an ageing group. Growth and youth are in the professional, technical, and managerial ranks.

The Future of the Trade Unions. The first question this raises is that of the future of the labor union. Trade unions in the United States are by no means confined to industrial workers. Transportation and communication workers, for instance, have the largest and perhaps the most pervasive unions. After all, the essence of an industrial economy is not the making of things; it is the moving of goods, of people, and of ideas and information. But the unions of industrial workers, that is of machine operators, such as the United Au-

tomobile Workers which Walter Reuther heads, or the Steel Workers, the Electrical Workers, or the Rubber Workers, have for twenty-five years been the dynamic element in American labor—dynamic both in terms of growth and in terms of leadership and vigor. Also, if only because their membership is concentrated in such major industrial areas as Detroit, Chicago, Pittsburgh, or Los Angeles, they have had the greatest political weight and voting power. Now, these dynamic industrial unions of yester-year face long-run stagnation, perhaps even shrinkage. All of them are becoming increasingly unions of the middle-aged, perhaps even of the ageing. They may even become unions representing the past rather than the future of our society.

Altogether there is a danger that the American labor movement may become a sterile defender of the past unless it succeeds in drawing to itself large numbers of the professional and technical employees—perhaps even of the managerial employees. It is doubtful whether these groups can be organized by any union to any extent. So far, the unions have had almost no success with them. These groups are not anti-union; but they do not believe that the union has anything much to offer them. They are certainly not attracted to the labor movement as it exists in the United States at present. They would demand great changes in principles, in methods, and in rhetoric. Yet unless the American labor movement can attract mass support from this group it will gradually become a minority pressure group, with great power for a long time to come but less and less representative either of the country or of the American worker. If this happens—and there are signs that it may already be happening—trade unions will also be less and less “liberal” in their general outlook. They may tend more and more to be defenders of gains already won and of privileges; that is, more and more “reactionary.”

The Economic Impact. There is another aspect of this shift in the structure of our working population: the impact it may have on our economy. Economists will no doubt analyse and discuss the American recession of 1957-58 for many years to come. But some basic facts stand out already—and they are new facts. Above all, what stands out is the tremendous resistance of both consumption and employment to a slump, and the extreme sensitivity of business income and profit. Production in three central industries of the American economy—automobiles, home appliances, and steel—dropped faster than we have ever seen production drop in such a short period. It dropped by 40 to 50 per cent. in seven months. But consumption in the country hardly fell at all: people shifted their buying rather than cut it, and employment even in the depressed industries dropped much less than production.

As an example, let us think of one of the big automobile companies whose production was halved; but total employment—that is, staff as well as operatives—fell by less than one-eighth, even though management frantically tried to cut costs. Profits, of course, disappeared completely as income from sales fell so much faster than costs. Actually this company, in common with many others, turned in a sizeable loss. This was typical of the general experience in the affected industries.

This is already the result of the shift in labor force from machine operators employed by the day or hour and paid by the hour or piece, to technical, professional, or managerial employees on salary. These are now both the largest and the most productive group in the work force. Blue-collar workers in the three industries—automobiles, appliances, and steel—suffered heavy unemployment, at least for short spells. But the salaried man stayed on the job. Employment of such people, as a rule, goes up and down with production not over the short-term but only over the very long period.

One might argue that this makes the economy more stable. One can also argue that it makes it much more vulnerable. Both arguments are being advanced by economists in the United States today, and paradoxical as this may sound, both may be correct. Employment and consumption stay high because so many people are employed regardless of the current level of business; our largest "industry," if one may call it that, is already education; and the employment of teachers is unaffected by short-run economic fluctuation. This gives the economy tremendous power to bounce back. But capital expenditures of business are likely to be cut back much more sharply as profits disappear and businesses run out of cash. This may push a slight, and by itself harmless, dip over the edge of a serious depression.

Economists are going to discuss this for years to come: but it is already clear that the shift in the structure of the work force has changed the economy drastically, and that traditional economic theory neither understands nor explains the new structure. All economists have assumed, as a matter of course, that the great bulk of the labor force in an industrial economy consists of industrial workers, of machine operators, of men who can be hired and fired according to the current level of business, so that business adjusts to short-run fluctuations in the economy by changing labor force and labor costs. This is no longer possible.

Another important question is what this shift in the structure of our work population might do to the direction in which the economy in the United States will develop. The large expansion since the end of the war has been in goods for the consumer—such things as houses, washing machines, television or furniture. As people's jobs and income improved, they bought things, that is, material objects. Is this likely to continue as the salaried middle class becomes the biggest group, and the one that is growing the most rapidly? Certainly, these salaried, middle-class people will not go

without these consumer goods, without houses or without appliances. But our manufacturers are finding out that it is the industrial worker who is more likely to buy a second television set or to trade in an old but still serviceable washing machine for a new one. The status symbols of the salaried middle class are much more likely to be different. For instance, more education both for themselves and for their children. Travel is another high priority of this group. Also, its members—for whatever reason—use the telephone much more, especially for toll calls.

Already there are signs of such a shift. The real “growth” industry in the United States in the last ten years was, for instance, not television, though it was certainly the most visible one. It was probably the publishing of paper-back books; and there has been a great shift in their public and their market and their content: history, foreign affairs, art, and religion are rapidly becoming paper-back staples. In other words, a paper-back is becoming one of the chief consumer goods of the new middle classes. Schools, travel, paper-backs, or telephone service, require other things. A shift in economic preferences would not necessarily lessen the demands for material production. But in requiring different things, the shift in the structure of our working population raises real questions regarding the direction of American economic growth.

Social Transformations. It is not only the American economy which is being transformed; the emergence of the salaried middle class is also affecting our social life—our politics, culture, values, our society as a whole. The new salaried middle class is already the leading group in our society. Take, for instance, the pleasant suburb outside New York City where I live. The people who were the “big men” in the town then, the people who headed the community activities—the hospital board, the vestries of the churches, or the school board, the golf club committee, and the Boy Scouts, and all the

thousand-and-one activities for civic and personal improvement which are the real living body of American social life—these people, only thirty years ago, were either respected professional men such as a leading lawyer or owners of businesses. Today, almost all these activities are headed by managerial or professional employees, the chief engineer of this company, the sales manager of another, or the personnel director of a third.

In politics these people are much less likely to form permanent party affiliations than either the industrial worker or the business owner. They tend to be independent in their vote, or, to the pained surprise of the politician, to split their vote. But they also tend increasingly to be impatient with traditional party organization, traditional party slogans, traditional issues.

Both our chief parties, the Republicans and the Democrats, are trying desperately to restore and to maintain their traditional alliances and allegiances, the allegiances of Theodore Roosevelt's or of Franklin Roosevelt's times respectively. Both attempts seem doomed to failure. But the new alignments, which will draw the new salaried middle classes into active politics, are still obscure, the new issues still hidden.

The greatest question, however, may be what the shift in structure of our working population means for our society. There have been many studies of the new salaried middle class of professional, technical, and managerial employees—in England as much as in our country. But we still know little about them. We know even less about a society in which this group predominates and in which it leads. They are "professional people," at least in their own eyes; but they are employed. They are subordinates, as a rule; but they consider themselves part of "management." They are managers or hope to become managers; but they are not "capitalists" any more than they are "proletarians."

The last great theory of society in the Western world was that of Karl Marx: it is now a century old. It was based on the vision—then extremely bold—of the emergence of the industrial worker or the machine operator, as the dynamic, growing class in society. For seventy-five years the machine operators were indeed the most rapidly growing group. Though they never became the majority in any industrial country, they became in every one of these countries the largest single group. This made marxism such a powerful creed and philosophy despite its many obvious weaknesses. Today—and not only in the United States—an entirely new class is growing and is rapidly becoming the largest single group: the professional, technical, and managerial employees who are neither “capitalists” nor “proletarians,” neither “exploiter” nor “exploited.” But as yet we have no social theory, no social philosophy, not even adequate facts and knowledge, about the new middle-class society and the new pace-setters within it.

II. The Educational Break-Through

I want now to discuss another and different, though closely related, change in American society: the rapid conversion of the entire American population into a highly educated, or at least a highly schooled, population.

Last year the United States Department of Labor announced that for the first time the majority of all those at work in the United States were people who had finished high school: they had spent at least twelve years at school as full-time students, and had remained in school till they were seventeen or eighteen. The situation is somewhat more extraordinary than the figure implies. For the less-schooled people are primarily older people, of over fifty. As they age and retire, the educational status of the working population will go up rapidly. Fifteen years hence, people without high

school diplomas will be scarce in the United States working population; they will be the decided exception rather than the rule, even in such educationally under-privileged groups as the Negroes.

Twenty years hence, the majority will be people who have had a considerably greater amount of schooling than these twelve years of primary and secondary school. For going to college—that is, going full time to school beyond the age of eighteen—is rapidly becoming general. One youngster out of three in the age group between eighteen and twenty-one is already in college. Since many more boys than girls go to college, you may say that today every other young man in the United States continues in school beyond secondary school and goes into university or professional training or some equivalent. College enrolment altogether is increasing rapidly—about twice as fast as population.

These figures bespeak an unbelievably fast change. When I first started work, a little over thirty years ago, secondary school education was still the exception, almost a rare exception, rather than the rule. I was then the only one among the young clerks in an export firm who had finished secondary school; and my bosses were certain, and made no bones about telling me, that all this education was a handicap to commercial success rather than an asset. Going to college then, thirty years ago, was confined to a very small minority. It was even then much more common in the United States than going to the university was in England or in Western Europe: but it was still rare. In the country as a whole only every twentieth youngster or so went to college.

An Educated Society. Thus the United States has become, within a short thirty years, an educated society; that is, a society in which almost everybody is expected to have the advanced, long, formal schooling which a generation ago was still confined to a small élite group. It is worth noting that

there is only one other country in which something comparable has happened during the same period: the Soviet Union.

Were I speaking to an American audience, I would now start talking about what all this means for education, its contents and subject-matter, its goals and standards, its structure and finance. Those with first-hand knowledge of my country will know that every American is an expert on three things: education, advertising, and baseball: so that I could be sure of the violent dissent of the great majority of my listeners in America, no matter what my own views on education. But I shall resist this temptation to talk about education as such. Rather I shall discuss the meaning of the educational revolution for our society.

Our word "school," and all its synonyms in other European tongues, comes from a Greek word meaning "leisure." Thus language still testifies to mankind's old conviction and experience that education unfits man for productive work. Only too obviously the man of education, however limited it may be, will shun the heavy toil, will forsake plough and potter's wheel. Throughout history, therefore, society has never been able to afford more than a small minority of educated people. In fact, ever since systematic education first began, educators themselves have always been haunted by the spectre of the "educated proletariat," by the danger of an unemployable and decaying surplus of educated parasites, too numerous for the few available job-opportunities for educated people, and too highly educated for honest work.

The Market for Knowledge. Today, however, we cannot get enough educated people. The job market in the United States last summer is a good example. With a recession, and with unemployment of six to seven per cent of the total labor force, one would have expected that jobs would be scarce for the newcomers leaving school. So it was indeed for

those who had no more education than secondary school—that is no more than twelve years or so of formal schooling. College graduates, who had four more additional years of schooling, usually with some degree of specialization in a major area, all got jobs, though for the first time in five years they had to hunt for them unless they were trained in such highly specialized and still scarce areas as engineering or teaching. But there was no recession for the holders of advanced degrees: indeed, the starting salaries offered them were considerably higher last summer than they had been in 1957 or even in the over-employment of 1956.

Today, in other words, we realize that our economic progress, our defense strength and our political position in the world depend more and more on constantly increasing the supply of highly educated people both in quantity and in quality. This has long been a slogan; Jefferson preached it in the late seventeen-hundreds; Macaulay in the early years of the last century. But now, for the first time, it is fast becoming social reality. Knowledge—rather than “labor” or “capital”—is fast becoming the central and the most productive resource of our society.

In the past the question has always been: How many educated people can a society afford? Today it is increasingly: How many people who are *not* highly schooled can a society afford? For anyone, we are now beginning to realize, who is not educated to the limit of his abilities (and some of us—I belong to them—would greatly prefer to say: who is not educated quite a bit beyond the limit of his abilities) is a social weakness and a productive loss. The knowledge which the educated person brings to work is also a very different resource from either “labor” or “capital.” It demands different jobs, different ways of organizing the work, different opportunities, and different rewards. This is true not just for those who hold, or will hold, jobs in management or research or who work in a profession. It is true for the great majority

—for they all increasingly have the background and expectations of the highly schooled person.

Problems of Automation. "Automation" is largely a first impact of this shift in the educational status of the population. Automation is not the replacement of human work by machine. The essence of automation is the replacement of manual labor, whether skilled or unskilled, by knowledge. It is not "saving of labor": automation usually does not mean fewer people at work; often it means more people at work. But it means different people doing different work. It requires such knowledge as is brought to work by the logician, the mathematician, the psychologist, the chemist, the engineer, the economist—a whole host of highly educated people where formerly we employed manual workers.

That we are moving fast to automation in the United States, much faster than anyone thought possible only a few years ago, is precisely because of the changed educational structure of the country. The young people who became available for work today have been sitting on school benches for twelve to sixteen years or more. They may not have learned much—I am not trying to judge the quality of the education they have received, and having four of my own children in school I am sceptical—but they certainly do not look forward to manual work, even to highly skilled manual work, and even to very well paid manual work. They are not looking for jobs, in other words, in the pre-automated factories or the pre-automated office. They expect jobs in which they will put knowledge and theory to work, jobs in which they apply what they have learned rather than jobs in which they apply skill gained through experience. It is no exaggeration to say that the assembly line which only a short time ago was considered really advanced productive technology is, in the United States, already obsolete, socially at least, if not yet technically.

But this raises a big question: just what do these people with their advanced formal schooling expect from work and jobs, from incentives and opportunities, from careers and working conditions? Most of them will stay in modest jobs all their lives. Yet these jobs, too, will be knowledge jobs requiring high-grade theoretical training and considerable judgment. All these people will have received an education which, in their fathers' time, was reserved for small, essentially upper and upper-middle class groups.

We have perhaps no idea how one really manages this kind of people. Our personnel management ideas, our personnel management policies, are based largely on experience with rank-and-file manual labor, especially in metal-working industries: essentially this is experience of the first world war. We all know that our ideas were never really effective or successful even for manual workers with a limited degree of formal education and with limited expectations in respect of opportunities. It is unlikely that they have even much relevance to these highly educated people who now come to work in industry and government and the armed forces. It is likely that we face brand-new problems which we do not even understand at all yet.

Social Changes. But this is only one of the impacts. It may not be the most profound impact of the educational change. There is, for instance, a totally unexpected impact on the family, on its size and on marriage age. It used to be almost axiomatic that the more educated people are the later their marriage age and the smaller their family. In fact a main concern of eugenics since the time of Sir Francis Galton a hundred years ago has always been that the intelligent and educated do not reproduce themselves. But today in the United States it is the most highly educated who marry early; a post-graduate student of twenty-four who is not married has become almost a rarity. One reason for this is

economic: it is the young wife, herself usually just out of college, who works to support her husband through his years of professional or post-graduate training. There are probably even deeper emotional reasons, however. Whatever the reasons, we have today three facts which only a generation ago we would have thought startling and most unlikely.

First, our young women¹ marry earlier than they have done for 200 years, and the more highly educated they are the earlier they marry; it is today the girl in the factory who tends to marry late rather than the girl in the university. Secondly, it is the highly educated today who start having children the earliest and tend to have the largest families. In Protestant working-class families in Detroit the two-children family is still common. But the highly educated young families tend increasingly towards the three- or four-children family; one sign of this is the pressure on our universities to convert more and more buildings into family apartments for married students, if not into day-nurseries for their children. Thirdly, more and more of the young educated women work to support a husband and a young but growing family. Perhaps no more than before want to make a career—and some of us feel that the “career woman” is disappearing; the dream of these young women is the day when they will stop working and will become housewives and mothers pure and simple. Still, they accept it as the normal obligation of a young educated woman to be the breadwinner and to get her man started right on his life and career, by giving him the opportunity of an advanced education.

The greatest impact, however, which the educational revolution in the United States is likely to have is on social values and social structures. It is at one and the same time the fulfilment of the American dream of social equality, and a threat of a new class-structure, of a system of privilege based

¹ Allowance is made here for such groups as the Negroes and socially isolated rural groups, e.g., in the Ozarks. The figures hold, however, for metropolitan areas.

not on money or birth but on education. As higher education becomes general, access to opportunities becomes increasingly open to all. But at the same time—and the process is going on at high speed—opportunities are increasingly being restricted to the highly educated. It is no longer uncommon for employers to demand a college degree even for sales-girls or secretaries; and without a secondary-school degree even an unskilled factory job may today be hard to get. This is not necessarily absurd. In hiring a sales-girl the employer may hire a future department-hand; in hiring a machine operator he may hire a future foreman or works-manager. But the fact remains that the higher degree is rapidly becoming what it never was before in the United States: the passport to opportunities.

Conclusion. Here, and in my earlier talk, I have tried to present two basic changes in American social structure: the emergence of the salaried middle class of professional, technical, and managerial people as the largest and fastest growing group in the United States; and the rapid, almost sudden conversion of the majority of the American people into people of higher, if not of advanced, education. I have tried to report rather than to appraise, and I certainly have not tried to judge.

But, in conclusion, I would like to raise the question whether these two developments have not fundamentally changed the character of American society. For almost 100 years it has been fashionable on both sides of the Atlantic to believe that American social developments follow, with a time-lag, those of Europe; Marx was the first to assert this, and it became almost an article of the faith for people on the left, Americans and Europeans, especially in the 'twenties and 'thirties.

This was always a debatable proposition. But there was some merit to it. It did, in some measure, explain to Euro-

peans what was happening in this complicated, confused, complex country that is America. Thirty years ago, for instance, we in the United States were still much more of an agricultural society than Britain or Germany; and it made sense then to expect that the continuing shift to an industrial economy would produce in the United States such results as the growth of labor unions, of social welfare and state control; in other words, things that paralleled earlier developments in Europe. Thirty years ago we ourselves thought that it was our job to catch up educationally with Europe: the development of the modern American university was one result of this belief.

Today, however, it is the professional, technical, and managerial group that is our leading group; and in education, certainly in respect of quantity and length of schooling, ours is rapidly becoming a society of universal advanced education. These developments may be good or they may be bad. They may be specifically American or they may indicate the roads which Britain and western Europe will travel too. But what is certain is that, for better or worse, we are developing something distinct. What is certain is that to understand this society of ours one will increasingly have to understand these developments. What is certain, finally, is that increasingly the success or failure of this American society of tomorrow will depend on its success or failure as an industrial economy, in which knowledge is the truly scarce and truly productive resource, and as a middle-class society of managerial and professional highly educated people.

RUSSIA AND AMERICAN EDUCATION

George Barr Carson, Jr.

I

IN ANY PLANNING for what ought to be done, in any field, one of the problems often confronted is the limitation upon thinking imposed by what is being done. One can easily survey statistically what is being done today and calculate rates of production or ratios of change. A given investment should produce x per cent increase or change. But I believe we are not necessarily planning for tomorrow by accepting a statistical extension of today's facts.

Ideally, education should be directed toward developing to the fullest any given individual's particular talents for learning. Practically, the direct or implied purpose of all public education is to develop effective citizens. Plainly, the immediate requirements in this regard could change almost from day to day. But an educational system would be impossibly chaotic under those circumstances. The time required for an effective educational process to work varies with individuals, to be sure, but in almost any instance it is too long to permit the close and unvarying correlation between training for citizenship and current policy which 100 per cent efficiency in a public educational system might logically suggest.

The essential conclusion to be drawn from a reminder of these familiar facts about our educational system is that we cannot effectively plan anything in it to fit *today's* needs. I think we should, for a moment, cut loose from any such base to consider what knowledge concerning Russia and the Soviet

orbit American education ought to provide. What can we do about planning under the shadow of today's needs without coming a cropper because of changes that are certain to come in this immediate situation and in the demands it makes upon us? What are the common denominators that would be helpful in a sound educational program even if the USSR ceased to exist as a political unit tomorrow?

Russian studies, for the great majority of individuals at all educational levels, can hardly be logically included for utilitarian purposes. The high school student, for example, engaged in such work as auto shop, secretarial skills, or cosmetology normally expects to use the work for trade purposes. In other than vocational skills, work in whatever area—math, foreign language, social studies—is general education and is no longer expected to serve direct vocational ends. A general education course may serve as preparation for professional and specialized work, or may introduce a student to knowledge of himself and society basic to good citizenship, but the knowledge gained is not something which in itself gives the student an immediately saleable skill in a commercial market.

Not every individual student is going to *want* to engage in Russian studies—whether language, history, economic institutions, geography, or what—any more than every individual student now wants to study English, science, and math, or any more than every adult wants to. A course that is not intended to serve purely vocational and professional purposes should give the student an understanding of the concepts and principles that are basic in Russian history, society, and language. Even the student who intends to embark upon a career of specialization in Russian area studies would benefit by learning these subjects at the preprofessional level almost exclusively as cultural subjects designed to enhance his intellectual breadth. This certainly means that they do not have to be tied to his own immediate daily experience; as a famous

historian once said, "Trying to teach the lessons of history without teaching history itself is like trying to plant cut-flowers."

II

In the study of any subject we want that type of knowledge which is going to be serviceable to the individual an indeterminate number of years later. Russian studies, to be of value under these circumstances, definitely should not be headline oriented. We cannot justify a subject only on the basis of headlines and today's importance—whether the subject is Asia, Africa, the Middle East, the Soviet Union—or the education is as ephemeral as the headlines. Some more enduring value in the study of the subject must be found or general education is not training people for what they need. There will be people with a detailed knowledge about Indo-China in 1954, whose knowledge is obsolete in 1958 when the focus of headline interest has shifted to Lebanon or Algeria. And the pattern will be repeated year after year.

Unfortunately headline orientation is one of the commonest devices for arousing interest and inspiring study, apparently under the assumption that it is easy or infallible or both. This scarcely seems appropriate if the main purpose of general education courses is to teach the ability to recognize the facts and understand the logic of an opposing point of view (whether the issue concerned is the nature of Soviet society, or the support of a rival political candidate, or whatever) without losing one's own sense of values. Such a lesson is not likely to be learned merely from a juxtaposition of facts in a Cold War setting, for one set will inevitably be cast as evil and the other as truth without any fundamental understanding of the foundation for either.

Arthur Adams's point ["The Impenetrable Front," in *The Centennial Review*, II (1958), 318] is, I think, well put—that "we must be willing to admit that more than one kind of

human truth exists on this globe; and we must be prepared to learn. This is not a plea that we try to understand communism better; we comprehend communist ideology and practice quite well enough to condemn it." That is, we do not accept it, preferring our own ideology, which we believe superior and incapable of improvement by borrowing, at least from communism. The latter is alien to our thinking and we wish it to continue so. What we need to learn about Russia and the communist orbit is the same thing that we need to learn from studying other eras in the past where the contemporary peoples were divided into two camps and each looked upon the other as the host of Satan.

Decades of bloody war—sometimes civil, international, guerrilla, and undeclared—were required to convince the peoples of Western civilization that Protestantism could not be extirpated by the sword. From the vantage point of the 20th century we can see the futility, in the long run, of some of the behavior of the 16th- and 17th-century men, and we recognize the possibility of a world in which both Roman Catholic and Protestant can live peaceably and constructively. The average 16th-century European would not have accepted that possibility, believing that sooner or later God in his wrath would destroy the opposition for the salvation of humanity.

Today of course we cannot employ the perspective of 400 years to view the "free-world" vs. "communist-world" struggle of the 20th century. But from the comparative approach to history we might learn much about ourselves, our world, and our future. Many people today appear to believe that the world cannot continue peaceably and constructively with communists or anti-communists both in it; sooner or later man in his madness must destroy the opposition. The evidence of history is against us. The cost of many a catastrophic conflict has been paid only to learn that the victors, whoever they may be, must learn to live in a world with the ideology

of the vanquished. The compromise that inevitably comes at the end of conflict has been based on a mutual recognition, tacit or explicit, of those common principles upon which both sides can live. This does not mean accepting all the enemy's principles, note; there would always continue to be doctrines on either side the other could not accept. But in effect there is an agreement to disagree and an acceptance of some common ground.

This understanding from comparative history we must learn, and it involves quite a different approach from one which seeks to show that on every point we are different—and better—and that in the end we shall destroy the enemy root and branch. It means an abandonment of the idea that we must prepare only and always for destruction, an acceptance of the idea that there can and will be formed some *modus vivendi*, and that this will happen whether or not there is another great effort to resolve the areas of conflict through force. The attitude in this matter of approach is fundamental *regardless of what selection of factual material or content is made for any course of study on Russia*. The end result to be achieved in Russian studies is, therefore, a realization that we are alike but also different, and that in those differences which exist because of genuine divergence in ideology we wish to remain different. But in those areas where we are alike we must face the fact honestly and frankly rather than try to twist the similarity, by semantic or any other trifling, to try to show we are not. Indeed one of the greatest advantages of the comparative approach to history is the value of learning to understand oneself by understanding others.

III

There was a period in American development when a prime function of the study of history in schools was a citizenship education for a melting-pot society. The perspective was di-

rected inward toward the United States and its institutions and customs. Large numbers of people from other backgrounds were being absorbed and all who were being educated needed a common focus to accomplish the melting-pot process. We no longer have those rivers of newcomers from old worlds.

The perspective in citizenship training now should be directed out from the United States toward the institutions and customs of other parts of the world. This is necessary because we are no longer trying to absorb the peoples of other institutional and cultural background; rather we are trying to make ourselves accepted in the world with which we can no longer escape contact. To do so we must make at least as comprehensive an effort to know others as we make to know ourselves.

Every society has a rule of order by which it operates—even if that rule is the uncontrolled caprice of a tyrannical individual. This does not mean that the United States must accept the rule of order that prevails in the USSR in order to deal with it. Knowing what the rule is, however, clarifies what can and cannot be expected of it and helps to locate those means by which common action or non-interference can be accomplished. We should know what this rule is, both for ourselves and for others.

To argue that we should learn to understand ourselves, and that trying to understand others will help us to do this, is certainly valid from a general educational point of view. But we can support the argument further with the practical consideration that all those in the educational system, whether they complete their formal education or not, will become voters.

In a democratically inspired society, it is not permanently satisfactory to delegate understanding of areas of vital national concern to a handful of experts. Appreciation of the issues and the basis of understanding them must permeate

the various levels of our society or we cannot maintain effective interrelationship between governors and governed and the principle of consent. A democratic society does not function because a few experts know how it operates and tell all the others what to do. It functions because all, or practically all, its members have a sense of its principles and a more or less instinctive response when they are called into play. Like the good language student, who when you ask him "Where are you going?" automatically responds "I'm going . . ." without stopping to consider whether he requires the first person singular of the verb *to go*, in the progressive form, etc. Only a general awareness of the instinctive reactions called for in a functioning democratically inspired society can make it work. In that way both leaders and those led have a common basis of understanding.

What we need to effect is that degree of general understanding of important foreign areas, or cultures, or societies, or states, which will permit intelligent communication between expert and layman. We must acquire sufficient knowledge of the foreign area to understand problems arising from relationships, forced or voluntary, with it, but without sacrificing our own values in the process.

The importance of foreign areas to the United States and to the education of its citizens, and in particular the significance of Russian studies, is excellently stated in a forthcoming paper by Dr. John R. Seeley of Toronto:

Education today stands shaken in the shadow of Sputnik—and, as usual, under attack for the wrong reasons, and at the wrong time, partly because education is misunderstood and partly, more seriously, because Sputnik is.

The satellite circles the heavens as the sign of a tremendous spiritual victory—and it is for that reason, if there is a good one, that we should be afraid. Problems in physics and mathematics of the order of magnitude involved are not solved by slaves; technologic triumphs on this scale are not achieved by individuals but by teams, and teams imply the morale we

covet, if we do not worship, in our group-oriented society. What is to see in the sky is then less significantly a symbol of the triumph of materialism and more surely a certificate that something has taken fire in Russia, something other than liquid oxygen, something not made with hands, something that takes fire when men serve, even when what they serve is not altogether or not at all admirable.

If it is the technological detail that we set ourselves to imitate instead of asking ourselves what is implied for our whole society, our way of life, our beliefs, and our educational system, we may well jeopardise together the society we belong to, the values that, however murkily perceived, we stand for, and the power-position, precarious as it is, that protects both.

I think this statement may well point the way to one of those common principles which must be discovered if two societies are to live together in the world peaceably and constructively.

We need the kind of organic, comprehensive program of foreign area studies in our public schools which I am talking about for material as well as spiritual reasons, to be sure. It may well be an elemental problem of survival, in that we should know in advance as much as we can of the kind of environment in which we must compete for survival. But we need to include Russian studies first and foremost because the Russians are *now* the kind of people who can produce Sputniks—an accomplishment that is not explained away merely by allusions to whips cracked over slaves.

Given the time required for learning, no program is going to provide overnight any general remedy to our present problem of inadequate expertness in non-Western languages, history, institutions, and culture. "Crash" programs can meet the irreducible demand by concentrating on a few people and training them without regard to the cost—to the persons or the programs—of ignoring other desirable educational ends. But the relatively inflexible public education should not be expected to convert *en masse* to any "crash" program.

IV

Yet the demands of international affairs require general knowledge of major foreign areas. Indeed if we had the kind of background from educational training that wide acquaintance with foreign languages, peoples, and areas would provide, we would probably be compelled to take much more part, economically as well as politically, in those areas. Too many people would know about the opportunities and the problems for a nation so responsive to popular awareness as the United States to ignore them. It is undoubtedly a major weakness of our educational system that we have made no serious effort to introduce Chinese study. It may indeed be true today that we have no particular *demand* for Chinese specialists. We have no intercourse with China, our official policy is to seek none, and this policy at the moment is static. And yet the population of China is the largest of any single linguistic or national group in the world, and if any of the facts just recited should change it might be important for us to have some basic background for the establishment of intercourse—whether economic, political, cultural, tourist, or what. It is extremely poor planning to assume that we may officially neglect nearly one fifth of the globe's inhabitants in our educational system because our government does not recognize theirs. One hundred years ago it made relatively little difference—the state of communications was such, the stage of economic development both in the United States and in China was such, and the role of the United States in international affairs was such, that our educational program was and should have been logically oriented to other areas. Today this is not the case, and we cannot escape the *effect* of the status of 20 per cent of the world's people, whether we recognize and understand that status or not.

So of Russia. Its population is not so large as that of China, but its role in areas where the United States has had and continues to show a vital economic, cultural, and political in-

terest, requires that we take cognizance of it. The same argument applies for the study of Spanish and of Latin America. We may not be taking an interest in the potentialities for us on the scale that this program implies for the USSR—but we *should* be. And so we should for China. Obviously it would be neither practical nor desirable to have every public school pupil learn Russian, Spanish, Chinese, French, German, Hindi, Arabic, etc., etc. But it is equally impractical for 92 per cent of those who study a modern foreign language to study Spanish and French, 5.6 per cent German, 2 per cent Italian, .4 per cent Russian and Portuguese, and no per cent Chinese, Hindi, etc.

If non-Western studies are to receive the serious attention which the role of the United States in international affairs requires, then there must be a change in their place in American education. What we should gain from foreign area studies is that degree of familiarity which, set alongside our familiarity with our own area, will enable us to act together on common principles while adhering to our own convictions on principles which are not common. Clearly, this result cannot be achieved by scissors-and-paste curriculum-making, inserting a unit here or an elective for academically talented there. We must divide the available time according to the significance to be attached to these studies.

Such a division, rather than interlarding special courses whenever the contemporary importance strikes us, will commit us to a long range approach. Much of the introduction of foreign area courses at present smacks of fad. The worst of reasons for introducing Russian language courses is that embodied in the often quoted statement that 10,000,000 Russians are studying English and only 8,000 Americans are studying Russian. Hundreds of thousands of Danes are studying English too—how many Americans are studying Danish? Danes study English for plain dollars and cents—or shillings and pence—reasons. What if we do not need the expertness

in non-Western areas which will result a decade or two hence by following a long range program? We should have at least as much familiarity to live at peace with any area of the world so large and so potentially valuable to us as customer or ally. To act otherwise would be to assume that if there were not a Cold War we would not need to take any interest in Russia. This is not the case.

Even if the Soviet Union should disappear into the sea, solving our biggest Cold War problem overnight—there is enormous gain from the study of Russian language, history, and institutions. There is the very practical lesson of what some of the effects may be from massive state planning in an interrelated advanced industrial society. There is a case history of the political consequences of monopoly party rule. There is the evidence of the power of nationalism (i.e., ideas) to withstand material pressure in modern society. There is, above all, the heritage of imperialism and colonialism in important remaining areas of the world—eastern Europe, India, China, and other territories non-contiguous to the Soviet Union which have felt the material or ideological impact of Soviet or Marxist imperialism and with which we still would have to deal—the Arab states, Italy, France, and the rest.

V

If language study is to be properly co-ordinated with area study of the region where the language is spoken, then we cannot use the present secondary school curriculum for the purpose. This is especially true if language study is looked upon in any event as primarily useful for those going to college. Not more than 14 per cent of those enrolled in secondary schools take any foreign language at all, and in some states—Indiana, for example—the figure is nearer 5 per cent. Yet about 30 per cent of college age young people enter college. To begin with then we can raise the questions—using

Russian studies as an example of foreign area programs—how widely should Russian be taught? Is it desirable as a first foreign language, a second, or what number? How general can we expect the study of Russian to be? What should our objectives be for the next five years?

With respect to language our objective should be to double the *percentage* of those enrolled in foreign language study. Without affecting the *number* of those now taking French and Spanish—the cultural, scientific, commercial, political, or general educational value of which it is not our purpose here to dispute—this would enable us to give more adequate recognition to other languages more important to our 20th-century world today than a generation or two ago. It would be a hopelessly divisive proposal to suggest today that Russian language should be the *first* foreign language taught. But we can expect to consider the desirability of having as many people study Russian as a first foreign language as study French or Spanish in that way. Then instead of having 92 per cent of those who study a foreign language in secondary schools study Spanish and French, 25 per cent will be studying Russian. There will still be at least as numerous an enrollment in Spanish and French as exists now, but we shall be adding substantial enrollment in Russian, as well as other languages now neglected. This will require that Russian become as widely taught as any modern foreign language in the curriculum.

VI

If we cannot expect modern foreign language study for all in the schools—and we cannot, since it appears in the program of so small a percentage of the enrollment now—we can be somewhat more uncompromising about foreign area study. Social studies *are* a part of all programs. Undoubtedly, it is in the social studies program, if anywhere, that the widest cross-section of the school population can be reached in for-

eign area studies. Again taking Russia as an example, how much and what kind of material on Russia can be introduced into existing courses?

Not much. Fifty years ago a fairly general pattern prevailed in secondary schools; four years of history (ancient, medieval, modern, and American) was common fare. But after history as then conceived was given the bounce in favor of a more broadly interpreted social studies the pattern changed. The only specifically required subject was American history, and it is only now that the requirement of two or three units of social studies is again becoming general, with a recommendation that four units be required appearing regularly in conferences on programs for the academically talented or other meetings concerned with continuing high standards in the secondary school academic program.

Of paramount importance to success in any Russian studies program is the recognition that (1) there are too many things now in the curriculum to allow for mere addition of any new desirable subject; for the new, something old must give way, and (2) schools cannot in the time available to them at present do the most effective job in teaching some of the subjects already offered. The present orientation of the social studies curriculum, so far as it is a *required* study, is toward America and Western civilization in the secondary school. Furthermore, the social studies curriculum leans heavily upon the value of emphasizing only the contemporary. The prevalent term "world history" for the only generally offered course in secondary schools aside from civics or social problems and American history may sound encouraging. But it is seldom required, and upon examination often proves to be a history of Western civilization, European centered, primarily in the last four centuries and designed to provide a backdrop for the study of American history and its antecedents.

Until our schools are prepared to recognize non-Western areas as deserving a time and attention proportional to that

devoted to America and western Europe, special projects for a few rather than systematic study by any representative cross-section of the school population is the most that can be expected. During the next five years our goal should be to take non-Western area studies out of the special projects category and give them an organic connection with the general education program. There are, happily, places where this has already been begun.

Perhaps it would be useful to point out what one can teach about Russia, taken as an example of foreign area programs, that would illumine our understanding of Russia in the world today and its relationship to us, and at the same time our understanding of ourselves. Certainly Russian history should be more than "chronologically-arranged facts about strange, bearded people doing un-American things." To integrate Russian history with the whole of a pupil's education, the question of Russian origins and the relation of Russia to Europe should be raised. In its origins Russia was a fusion of Germanic tribal custom and Greek Christianity imposed on a Slavic population. Medieval Western civilization similarly grew out of the fusion of Germanic peoples and Latin Christianity. Students should not be permitted to forget, in this age of Soviet anticlericalism, that Russia was a great Christian country throughout the centuries which witnessed the rise of the major western European nation states.

A sound interpretation of Russian history must include an examination of whether we should regard Russia as part of the Western world or not. Arnold Toynbee tests the line between Western and non-Western civilization by adherence to Latin Christianity. During the expansion of Western civilization other parts of the world borrowed, or were forced to adopt, aspects of Western civilization. Russia fought the eastward expansion of Europe as systematically as it had the westward expansion of central Asia during earlier centuries. Both America and Russia can be seen as extensions of Eu-

rope, America as a positive extension becoming a new center of Western civilization, Russia as a negative reaction, learning from Europe but holding to its own Messianic vision, adapting what it learns for combating European hegemony, and treating Europe as the corrupt deviant in the development of civilization. The thesis that Russia will replace Europe as the center of civilization has a long tradition in Russian history and should be one of the insights into Russian development acquired from a Russian studies program.

The periodization of Russian history can be used to illustrate some important universal principles in the history of other modern civilized peoples. The significance of 1861 as a turning point in Russian history is well recognized. What should be equally recognized is the continuity between pre- and post-1861 peasant life. As is always true in any major revolutionary upheaval, the characteristics of the prerevolutionary organization of society that were preserved may be quite as important as those which were changed. The same, in differing degree, is true of the problem of 1917 as a turning point in Russian history.

There are also several topics tinged with controversy that should serve to broaden students' basic information about modern society. The relationship between economic development and political and social structure in Marxian thought is one. Another is the problem of large-scale state planning and operation of an advanced industrial economy. The restriction to the Cold War concept to examine the Soviet orbit, and the tendency to use Communist stereotypes, both can obscure the fact that Soviet society is not static; students should learn that even Soviet institutions and concepts have a dynamic character, despite the doctrinaire nature of Soviet Marxism. Soviet budgetary development, financing, and management incentive problems, the experimentation with centralization and decentralization in administrative organization, all are instructive when compared to basically simi-

lar problems of advanced industrialization whether in the USSR, the United States, or elsewhere. In this respect Russian studies should serve directly to help students understand our own industrial society better.

These are some aspects of Russian history and institutions that should be made generally available. They should be introduced by broader use of comparative history in the social studies units now offered to all, by teachers trained to understand them, and expanded in special units designed to emphasize the integral role of foreign area studies in any general education program.

But even the gains from a program of systematic study in school can be quickly stifled by an attitude unfavorable to them outside of school. There is a social demand today particularly for those subjects dealing with scientific knowledge and technology. A society that passively accepts the diversion of its talents from the coequal study of humanities and of physical matter can lose the battle for self-preservation—and a battle is none the less lost for the spectators being unaware the fight was on. "If we are not good citizens we can hardly expect the schools to make good citizens of our children. If there is a conflict between what is taught in the school and what is done in the community, it is not the school which will be victorious." [Edgar B. Wesley *et al.*, *American History in Schools and Colleges* (New York, 1944), pp. 23-4] Therefore communities—in the widest sense of home, town, and nation—must support foreign area study. Foreign area study is not a task we can wish off on the schools and consider done. Only by securing community recognition of the effort and its import are the young people who take such programs going to be convinced of their importance and their value, without which any but the most ephemeral and fad-dist inspiration will be impossible.

SCIENTIFIC CREATIVITY*

Henry Eyring

EACH PERSON IS BORN into an environment with a language and culture that provide a more or less complete world view. His first conflicts with the notions he has learned he usually correctly assumes will be resolved when he understands the accepted views better. Sooner or later, however, he comes up against glaring inconsistencies which bring his conceptual world into serious question. The necessary reconstruction is the beginning of a creative process limited only by the expertness of the innovator and the time devoted to it. This intellectual construction of a world picture is an extremely important aspect of scientific creativity.

Operational Character of Science. Beginning chemistry sparked one of these earliest re-evaluations for me. Professor Tartarian, an excellent teacher at the University of Arizona, nevertheless presented the chemistry of copper in a didactic fashion with little regard for the experimental evidence for his revelations. It was a matter of real satisfaction when I finally realized that copper is simply a name useful in describing a certain collection of experiments, that most any other name would have done as well, and that the experiments reported in the literature might be or might not be reproducible. Thus science became for me operational, something to be tried over again if questions remained.

Recurrence and the Idea of Variables. As soon as one gets to

* This paper is the substance of an address presented at the Interdisciplinary Symposia on Creativity, Michigan State University. The address will be published in Harold H. Anderson, ed., *Creativity: and its Cultivation* (New York: Harper and Brothers, publication Spring 1959). Reproduced by permission of the editor and the publisher.

the point of making systematic observations the question arises as to what observations are worth recording. Clearly any actual event is extremely complicated, and if described in sufficient detail is unique in the history of the world and will never recur. Such a detailed view of things, being non-recurring, can help us to understand neither the future nor the past. Only those aspects of a situation which recur can give us useful insight. Thus, in science, whether or not we say it, we always mean that in comparing two events certain special aspects of the situation are changed while everything else that matters is kept the same. Thus we have forced upon our attention the idea of variables which influence events.

Time as a Variable. Very early in this process we are obliged to give a meaning to time. The conception of elapsed time resolves itself into the recognition of change. Time is measured by counting the number of recurrences of some cyclical process. The usefulness of the conception of the uniform flow of time becomes apparent as soon as it is clear that many seemingly independent cycles have durations which are in fixed proportions to each other. This correlation between the duration of isolated events is simplest to understand when we consider identical systems. For example, either of two ammonia molecules invert 2.39×10^{10} times per second, as can be shown by microwaves, because they are identical and there is no reason for them to behave differently. This orderly periodicity of an almost endless variety of events is a verifiable and exciting fact of nature. We might with Newton think of a uniform flow of absolute time in which all these events are taking place, or we might think that there is a correlation between durations because one periodicity is in fact determined by all the others. The special theory of relativity forces the latter conclusion since the relative velocity of two systems shifts one frequency with respect to the other. As always, however, this result arises from a conscious

choice. One has elected to treat the velocity of light as the same in the resting and in the moving system, and let the moving clocks and moving meter sticks change their values in the appropriate way for this to happen.

Positional Coordinates. The Foucault pendulum with its bob at the end of a long wire vibrates on a near frictionless support and oscillates in its fixed plane in space as the earth turns under it. With the disappearance of the ether and Newton's absolute space, cosmologists are faced with the problem as to what determines the inertial coordinates for the pendulum. Again one adopts the view which is consistent with relativity that the coordinate system for one body is determined by the rest of the bodies in space. Somehow this Foucault pendulum knows about all the other bodies that are far away and ignores the earth that is right next to it; it chooses to move in a plane that stays invariant with the distant stars and ignores the earth that is turning under it. It is interesting that the laws of Newtonian mechanics, relativity, and quantum and statistical mechanics are relations between these space and time coordinates, together with such derived properties as energy and momentum.

Some Factors in Discovery. Now Newton could arrive at his law that in the absence of such things as viscous resistance the mass of a body times its rate of change in velocity is equal to the force acting on it only by ignoring Aristotle's incorrect notion that force is always required to keep a body moving at a constant velocity. Newton's task was made more difficult because under certain circumstances Aristotle's law is actually true. For example, force is required to propel a body at constant velocity through a viscous medium. This is illustrative of the enormous complexity of natural phenomena. Creativity is rarely a single flash of intuition, but usually requires sustained analysis of a great many observa-

tions to separate out the significant factors from the adventitious. A keen observer once said of Einstein that part of his genius was his inability to understand the obvious. Rejection of superficial explanations of one's own as well as of others is prerequisite to understanding. To reach a correct solution efficiently also requires unconcern for all else except the truth. Science practised to bolster a faulty hypothesis rather than to test it objectively is often worse than useless.

Some Characteristics of the Effective Innovator. Undoubtedly the prospective scientist should arrange to be born with the right genes. Anyone who has examined the variations to be found among individuals with ostensibly equivalent training cannot escape this conclusion. However, even the gifted individual requires a stimulating environment, including freedom from distractions which deflect attention from the question at issue, and freedom from an authoritarian society which prevents unbiased enquiry. He profits likewise from congenial surroundings and stimulating company. He should preferably be completely at peace with the world except for the violent conflicts characterizing the problem engaging his attention. Thus he needs to be independent of all types of vicious circles which deflect attention from the problem at hand. The lone wolf has solved many problems, but an increasing number of scientific enterprises are becoming highly cooperative and require social integration. No degree of talent can compensate for an impossible personality inside the large scientific laboratories which are doing an ever increasing proportion of the creative work of the world.

The Creative Process. No serious investigator need ever be without a suitable problem appropriate to his talents. Every field either (a) is well understood, in which case a book can be written about it, or (b) it consists of uncorrelated experimental and theoretical material suitable for a review article,

or (c) certain experiments are in need of theoretical explanation, or (d) critical experiments are needed to settle knotty questions. Only lack of interest or of time or an overwhelming ineptitude deters the prospective investigator from the creative process. Usually the excuses given for failure betray an amazing inventive talent and a vivid imagination. Such brilliant efforts are worthy of better causes. On the other hand, a genuine tragedy is presented by the brilliant mind with a critical faculty so far outrunning creative imagination that the unhappy possessor is forever condemned to bitter sterility. How often such cases are really incurable and how often cooperation, encouragement, and the elimination of the effects of hypercritical companions can work a cure are of the greatest importance.

Creativity is manifested at many levels and takes a variety of forms. An exciting variety is the recognition of analogies. By this means a fruitful new field was born when van't Hoff long ago recognized that large molecules confined to one side of a membrane by their inability to permeate it nevertheless sucked the solvent through from the other side because of the tendency of the large molecules to expand the space available to them, just as a confined gas would do. As a result, the laws of gases were taken over intact and applied to interpret osmotic pressure. The faculty for recognizing such an analogy resembles the ability to recognize a recurrent musical theme running, with variations, through a composition. After the variations are stripped away the recurring pattern is recognized for what it is.

Still another such example is the recognition of the thermodynamic equivalence of a molecular sized hole in a liquid to a molecule in the gas phase. Thus it costs the same amount of energy to vaporize a molecule as it does to create a molecular sized hole in the liquid. Furthermore, holes in the liquid and molecules in the gas dart around with the same speed and abandon, so that each possesses the same en-

tropy. It follows from thermodynamics that two such species with the same energy and the same entropy will be equally abundant. Thus we can say that in a cubic centimeter of the vapor there are just as many molecules as there are molecular sized holes in the liquid. Thus the sum of the densities should be a constant, and we have a deep insight into the famous law of rectilinear diameters of Cailletet and Mathias. Because holes smaller than molecular size also accumulate in the liquid, the sum of the densities of gas and liquid actually decreases slightly with temperature in a linear fashion. This picture of holes in liquids not only led me to the above explanation, but to a detailed theory of the liquid states, including both thermodynamic properties and molecular transport. Similar considerations involving this concept of duality between particles and holes pervades a great deal of particle physics. The idea of duality between points and lines is an extremely fruitful analogous concept in mathematics.

Idea-Generating Concepts and Intuition. From time to time exciting new principles are required to explain experimental facts. Not infrequently the concepts have been guessed at for ages, but until the proof of their correctness is available, such guesses can only be suggestive and are often ignored. A famous example is the insistence of Democritus and Lucretius that matter is composed of discrete particles. The peculiar shapes of the particles were supposed to account for differences in properties of the different substances. More than a millenium later, evidence had finally accumulated that elements combined in definite proportions and that when the same elements formed a second compound, the ratios of the amounts of the elements were in simple multiples of those found in the first compound. Dalton marshalled the evidence and was able to show convincingly that this evidence required the conception that the elements are formed of discrete particles—atoms—which are combined in various propor-

tions to form a variety of compounds. Which was the discovery, the intelligent guess of the principle or its proof? Here the answer is unmistakable. The inspired guess bore no fruit through the centuries, while the principle once proved was immediately fruitful. A characteristic feature of a good proof is that it can be repeated and understood. People who have been right in a scientific matter and yet have been generally ignored by other competent scientists usually lacked sufficient proof.

It is interesting to consider what qualifications make for scientific intuition. The familiar story of the lost race horse is instructive. The lost horse was sought for all day by the entire town, unsuccessfully. On the second day the village fool went out and in an hour returned with the horse. In response to enquiry as to his procedure, he explained that the first day he sat and thought what he would do were he a horse. On the second day he went to the point where he himself would have gone. The horse was there. If one wants to become a chemist one in effect becomes a molecule. In the process, he almost thinks of himself as one and gets to know them as he would know his friends. And if he is to be creative, he walks down the street and mistakes one of his friends for a molecule on occasion. I mean to say that surely the understanding of the molecular world, the physical world, is only to be had at the price of deep interest.

Another example of an idea-generating concept may be instructive. The activated complex in the theory of chemical reactions is an example of such an idea-generating concept. The atoms in molecules are held together by chemical bonds. These bonds consist of two electrons shuttling back and forth between a pair of atoms much as two baseballs might be kept in the air by passing them between two players. Mesons hold nucleons together in the nucleus in an analogous manner. This shuttling back and forth of the electrons lowers the electronic kinetic energy with no corresponding rise in po-

tential energy. The lowering of kinetic energy arises because the longer electronic path constitutes an increase in wave length and hence a decrease in frequency and therefore of energy. A chemical reaction between two pairs of bonded atoms occurs when they crash into each other with such great force as to forget to whom they belong, subsequently separating with new partners. Concurrently, the electrons alter their path to circulate about the new partners. The crowding together of the two pairs of bonded atoms in the activated complex results in one electron pair's being pushed into a higher energy state. This high energy electron pair, as a result of this promotion in status, avoids running into the other electron pair which completely preempts the lowest state of the four-atom system. This general result, that one pair of electrons having opposite spins fills up a state, is known as the Pauli principle.

The metastable, intermediate state between reactants and products, as was indicated, is called the activated complex. A clear visual picture of the activated complex requires an understanding of the potential energy surface in configuration space. A sufficient number of the interatomic distances of the complex to fix its configuration are plotted. These distances are taken normal to each other and to the energy coordinate of the system in hyperspace. Such a plot yields a potential energy surface in configuration space. The resulting surface has the features of an ordinary landscape with the low valleys corresponding to stable chemical compounds. These valleys are connected by passes through which the reactants pass into the new valley forming reaction products. The activated complex is much like an ordinary molecule except for the internal translational degree of freedom corresponding to the passage over the potential barrier in configuration space. Transit across the barrier is so fast that the activated complex survives only a kinetic jiffy (10^{-13} seconds at ordinary temperatures). As a result its properties must be

deduced from quantum mechanics or from reaction rate data. Its fleeting existence precludes direct measurement. With this conception of the activated complex reaction kinetics is finally systematized to the same extent that equilibrium theory is systematized by thermodynamics.

The velocity of any reaction at unit concentration of reactants takes the form $k' = \kappa \frac{kTK^\ddagger}{h}$, where K^\ddagger , like any equilibrium constant, fixes the concentration of activated complexes, $\frac{kT}{h}$ gives their rate of decay, and κ is the fraction decomposing which do not immediately reconstitute themselves. This rather technical theory is outlined here because it is the point of departure for understanding all chemical changes and is also an example of creativity falling within the author's experience.

It is perhaps instructive to detail the genesis of the activated complex concept as I recall it. Fritz London in 1928 suggested an approximate way of constructing potential surfaces in configuration space using the quantum mechanics. In the spring of 1930, following a modified procedure, I laboriously constructed such a surface for the reaction of a hydrogen atom with a hydrogen molecule, in collaboration with Professor Polanyi. It occurred to me that if the potential surface for three atoms colliding along a line were constructed to scale, a ball rolled on this model surface would mimic the behavior of the three-atom system. The next time I met with Professor Polanyi at his home in Zehlendorff, Dr. Wigner was there, and I spoke of this concept. Dr. Wigner said, "That is a beautiful idea." He proceeded to sharpen this concept in an addendum to a paper by Polanyi and me, and in 1933, with Pelzer, he extended his ideas into a statistical mechanical calculation of the rate of the hydrogen reaction using the potential surface Polanyi and I had calculated. In 1935, after much labor, I gave the generalized version of reaction rates, introducing the idea that the activated complex is like an ordinary molecule, except for a fourth

translational degree of freedom. Polanyi and Evans followed this with a lucid treatment emphasizing pressure effects.

Several points are interesting in this bit of history. First, had there been some easy way to calculate potential energy surfaces, I would probably not have labored over them to the point where the concept of a ball rolling through the saddle point was hammered into my consciousness. Secondly, although the potential surfaces one can construct are very rough, and the purist suffers when he uses them, still they provided the bridge one must use to cross over into the field of general reaction rate theory. When quantum mechanical methods yield better surfaces, this progress will eventuate in a refinement rather than in any major change in our concepts of reaction rates.

This experience highlights certain conclusions. First, the innovator must usually find his way by means of unfinished bridges. Also, in science, as elsewhere, the blazed trail precedes the broad highway. Finally, the development of the theory of absolute reaction rates illustrates another fact observed many times before. One's successes are always related to and built upon the findings of others. Creativity in science, as with most human enterprises, prospers most in a friendly atmosphere of cooperation.

The Creative Environment. Looking back over my experiences at the Universities of Arizona, California, Wisconsin, Princeton, and Utah, and the Kaiser Wilhelm Institute in Berlin, it is clear to me that really interested investigators were never stopped from doing research by difficulties. There is always a way. At Arizona, Ernest Anderson worked early and late singing hymns and extracting the various sugars from the gums of all kinds of desert plants, while Professor Douglas intrigued the world with his tree ring dating. Later at Berkeley in G. N. Lewis's laboratory, there was no place for scientific onlookers. Everyone did research and compara-

tively little teaching. My only formal course in chemistry for the Ph.D. degree was thermodynamics. This was in spite of the fact that my earlier training was as a mining engineer and metallurgist rather than as a chemist. The preliminary examinations were perfunctory, but the minor in mathematics involved taking a substantial amount of classwork. In spite of a belief in light teaching loads for the professors, it was recognized by Lewis that freshmen at the beginning of their career respond to expert teaching. This teaching was provided through the general chemistry lectures given by Joel H. Hildebrand. In addition, every professor was expected to teach one laboratory section of freshman chemistry. In this way even the freshmen were thrown into the company of accomplished scientific investigators. The results on the students were interesting to watch. Some students certainly elected chemistry as their life's work who would otherwise have passed it by.

The stream of outstanding physical chemists turned out by the G. N. Lewis school at Berkeley includes three Nobel prize winners. The success of Berkeley has frequently been cited as establishing the superiority of a system in which the entire emphasis was on research to the exclusion of course work. This too facile explanation leaves out of account the very significant fact that Lewis's fame and the high quality of his staff attracted a substantial fraction of the best talent available. With such a clientele most systems would have succeeded. The fact remains, however, that at Berkeley graduate students mingled with outstanding scientists who entertained no doubt that intelligent research was the most important activity in the world. This contagion infected everyone. Individual success in research was accompanied by a shedding of any undue veneration for the embalmed science of the past. Seminars led by Lewis were always exciting, even when the blackboard could be but dimly seen through the blue haze of tobacco smoke exhaled by the addicts.

tential energy. The lowering of kinetic energy arises because the longer electronic path constitutes an increase in wave length and hence a decrease in frequency and therefore of energy. A chemical reaction between two pairs of bonded atoms occurs when they crash into each other with such great force as to forget to whom they belong, subsequently separating with new partners. Concurrently, the electrons alter their path to circulate about the new partners. The crowding together of the two pairs of bonded atoms in the activated complex results in one electron pair's being pushed into a higher energy state. This high energy electron pair, as a result of this promotion in status, avoids running into the other electron pair which completely preempts the lowest state of the four-atom system. This general result, that one pair of electrons having opposite spins fills up a state, is known as the Pauli principle.

The metastable, intermediate state between reactants and products, as was indicated, is called the activated complex. A clear visual picture of the activated complex requires an understanding of the potential energy surface in configuration space. A sufficient number of the interatomic distances of the complex to fix its configuration are plotted. These distances are taken normal to each other and to the energy coordinate of the system in hyperspace. Such a plot yields a potential energy surface in configuration space. The resulting surface has the features of an ordinary landscape with the low valleys corresponding to stable chemical compounds. These valleys are connected by passes through which the reactants pass into the new valley forming reaction products. The activated complex is much like an ordinary molecule except for the internal translational degree of freedom corresponding to the passage over the potential barrier in configuration space. Transit across the barrier is so fast that the activated complex survives only a kinetic jiffy (10^{-13} seconds at ordinary temperatures). As a result its properties must be

deduced from quantum mechanics or from reaction rate data. Its fleeting existence precludes direct measurement. With this conception of the activated complex reaction kinetics is finally systematized to the same extent that equilibrium theory is systematized by thermodynamics.

The velocity of any reaction at unit concentration of reactants takes the form $k' = \kappa \frac{kTK^\ddagger}{h}$, where K^\ddagger , like any equilibrium constant, fixes the concentration of activated complexes, $\frac{kT}{h}$ gives their rate of decay, and κ is the fraction decomposing which do not immediately reconstitute themselves. This rather technical theory is outlined here because it is the point of departure for understanding all chemical changes and is also an example of creativity falling within the author's experience.

It is perhaps instructive to detail the genesis of the activated complex concept as I recall it. Fritz London in 1928 suggested an approximate way of constructing potential surfaces in configuration space using the quantum mechanics. In the spring of 1930, following a modified procedure, I laboriously constructed such a surface for the reaction of a hydrogen atom with a hydrogen molecule, in collaboration with Professor Polanyi. It occurred to me that if the potential surface for three atoms colliding along a line were constructed to scale, a ball rolled on this model surface would mimic the behavior of the three-atom system. The next time I met with Professor Polanyi at his home in Zehlendorff, Dr. Wigner was there, and I spoke of this concept. Dr. Wigner said, "That is a beautiful idea." He proceeded to sharpen this concept in an addendum to a paper by Polanyi and me, and in 1933, with Pelzer, he extended his ideas into a statistical mechanical calculation of the rate of the hydrogen reaction using the potential surface Polanyi and I had calculated. In 1935, after much labor, I gave the generalized version of reaction rates, introducing the idea that the activated complex is like an ordinary molecule, except for a fourth

translational degree of freedom. Polanyi and Evans followed this with a lucid treatment emphasizing pressure effects.

Several points are interesting in this bit of history. First, had there been some easy way to calculate potential energy surfaces, I would probably not have labored over them to the point where the concept of a ball rolling through the saddle point was hammered into my consciousness. Secondly, although the potential surfaces one can construct are very rough, and the purist suffers when he uses them, still they provided the bridge one must use to cross over into the field of general reaction rate theory. When quantum mechanical methods yield better surfaces, this progress will eventuate in a refinement rather than in any major change in our concepts of reaction rates.

This experience highlights certain conclusions. First, the innovator must usually find his way by means of unfinished bridges. Also, in science, as elsewhere, the blazed trail precedes the broad highway. Finally, the development of the theory of absolute reaction rates illustrates another fact observed many times before. One's successes are always related to and built upon the findings of others. Creativity in science, as with most human enterprises, prospers most in a friendly atmosphere of cooperation.

The Creative Environment. Looking back over my experiences at the Universities of Arizona, California, Wisconsin, Princeton, and Utah, and the Kaiser Wilhelm Institute in Berlin, it is clear to me that really interested investigators were never stopped from doing research by difficulties. There is always a way. At Arizona, Ernest Anderson worked early and late singing hymns and extracting the various sugars from the gums of all kinds of desert plants, while Professor Douglas intrigued the world with his tree ring dating. Later at Berkeley in G. N. Lewis's laboratory, there was no place for scientific onlookers. Everyone did research and compara-

tively little teaching. My only formal course in chemistry for the Ph.D. degree was thermodynamics. This was in spite of the fact that my earlier training was as a mining engineer and metallurgist rather than as a chemist. The preliminary examinations were perfunctory, but the minor in mathematics involved taking a substantial amount of classwork. In spite of a belief in light teaching loads for the professors, it was recognized by Lewis that freshmen at the beginning of their career respond to expert teaching. This teaching was provided through the general chemistry lectures given by Joel H. Hildebrand. In addition, every professor was expected to teach one laboratory section of freshman chemistry. In this way even the freshmen were thrown into the company of accomplished scientific investigators. The results on the students were interesting to watch. Some students certainly elected chemistry as their life's work who would otherwise have passed it by.

The stream of outstanding physical chemists turned out by the G. N. Lewis school at Berkeley includes three Nobel prize winners. The success of Berkeley has frequently been cited as establishing the superiority of a system in which the entire emphasis was on research to the exclusion of course work. This too facile explanation leaves out of account the very significant fact that Lewis's fame and the high quality of his staff attracted a substantial fraction of the best talent available. With such a clientele most systems would have succeeded. The fact remains, however, that at Berkeley graduate students mingled with outstanding scientists who entertained no doubt that intelligent research was the most important activity in the world. This contagion infected everyone. Individual success in research was accompanied by a shedding of any undue veneration for the embalmed science of the past. Seminars led by Lewis were always exciting, even when the blackboard could be but dimly seen through the blue haze of tobacco smoke exhaled by the addicts.

Another point was significant. The new graduate student was given keys to all the stockrooms. This was in fact a presentation of the "keys to the city." With this handsome gesture went a few words on acceptable conduct. So far as I remember, people responded to this generosity admirably. The chemistry department at Berkeley was, in fact, a society of scholars. Successful research was the badge of honor. Not to try to do research was unthinkable. The research atmosphere provided at Berkeley has probably rarely been equalled. Granting this, I nonetheless would have added a few more courses and made the preliminary examinations more searching.

Wisconsin in 1927 was good but different. It was much more decentralized. Daniels and Adkins, among others, were nuclei around whom good men gathered. Courses were more numerous and preliminary examinations harder. The research fund provided by Steenbock's patents on food irradiation paid for research fellowships and equipment. In its best fields Madison rivalled Berkeley.

Geheimrat Haber's Institute in the Kaiser Wilhelm Institute of 1929 also sparkled. Haber's poor health did not prevent his making incisive comments and he surrounded himself with Europe's top scientists such as Freundlich, Polanyi, Bonhoeffer, Fritz London, and Eugene Wigner. The facilities were good and the personnel the best. Again there was freedom, encouragement, and good library facilities. Chemical research at Dahlem was high adventure.

A stimulating year in Berkeley, 1930-31, was followed by fifteen years at Princeton. Here one saw again an exciting research center not quite like anything that had gone before. A quota system restricted graduate students in chemistry to twenty-five. This could be stretched to thirty students. An excellent supply system provided everything needed to work with by signing it out. Seminars were frequent and lively. H. S. Taylor was particularly effective in focusing discus-

sions on the essential point in any scientific discussion, and everyone entered freely into the discussions. More course work was required than at Berkeley, and Ph.D. preliminary examinations were more searching. The graduate students again were excellent, since only about ten could be accepted from a hundred very good applicants. Here again everything that would stimulate the creative process was used.

The last eleven years at Utah have been concerned with the setting up of a Ph.D. program and watching it grow. Because the foundation had been well laid earlier, this has been a pleasant, successful operation. Our program more nearly approximates that at Princeton than the one I knew at Berkeley. About fifty Ph.D. candidates in chemistry work as teaching fellows, as research fellows, or on various supported projects. Again a spirit of friendly, active cooperation is the creative atmosphere aimed at.

The Future Outlook for Creative Investigation. Chemical investigation in this country has been stimulated tremendously by the money invested in research by government agencies and by the high income tax laws which prompt industry to strengthen their position by plowing back into research some of the profits that would otherwise be partly taxed away. Out of our present tremendous research effort, which in the best interests of society should be doubled, we are nonetheless witnessing a material advancement never even imagined before. Even to mad men it must be clear that world-wide cooperation in creative research can solve all our economic woes, and that following any other course will lead the world to destruction and unimaginable human misery. To be optimistic of continuing success in the current tremendous creative effort requires only the faith that mankind is not insane. With the unlocking of atomic secrets man has acquired the capacity to make the world uninhabitable. Society can not now allow power over atomic forces to fall into the

hands of any single individual, since in that case human existence will hinge on the slender thread of one man's sanity. Genuine democracy with its checks and balances has an urgency about it in these days of mortal peril which never existed before. Society will succeed in continuing its creative advance because the alternative to this is irreversible disaster to everyone.

THE ROLE OF FOLKLORE IN DISCOVERY AND REDISCOVERY OF PLANT DRUGS

E. H. Lucas

I

THE INSTINCTIVE REACTION of most of our contemporaries to the implication that folklore may have anticipated scientific facts is one of disbelief. Folklore is known to be a variety of popular thoughts and customs all of which seemingly spring from knowledge of, or usage by, ignorant or at least uneducated people. Obviously then, a correlation of folklore cures and scientific findings would be difficult to understand.

The origin of so much that is classified as folklore is obscure. The personality of the originator has become unessential, the substance of the lore as property of the people the overshadowing fact. Yet there is every indication in the case of plant lore that individuals who stood out by their imagination, curiosity, and inventiveness were in most cases responsible for the discoveries.

Word of mouth must be assumed to have been the most important means by which information came down from generation to generation, especially if one considers the destructibility of written records and the great odds against retaining them unless they were compiled in the form of books. Survival of family or tribal lore was far more secure. It is most likely, however, that when someone undertook to write a herbal, any information that had been passed on became recorded therein. Very few of the herbalists of ancient times claim to have originated the remedies they enumerate and describe. They simply state their existence and use,

rarely mentioning the source of information. Thus it is more than likely that what we commonly call folk remedies actually were prescribed by the equivalents of the modern physician, although in practically all cases their names have been forgotten.

It is virtually impossible to trace the origin of a particular plant remedy to its source. Almost all herbals of the Middle Ages and the Renaissance are compilations of earlier records. Now and then new plants appear in these books, but it is easier to connect them with a period than with a particular author. According to Agnes Arber (1) many of the herbalists who lived between the 15th and 17th centuries found—and perhaps used for medicinal purposes—some new plants, but most of the material presented in their books had been handed down to them. The farther back one goes in the history of herbals, the more obscure becomes information regarding authors and sources. There is widespread belief that Greek and Roman cultures produced the first and original compilations. Most of the medieval literature in this field, for example the so-called *Codex Vindobonensis*, is indeed based on writings which originated during the centuries immediately preceding and following the birth of Christ. It is increasingly difficult to penetrate the darkness that surrounds earlier ages and therefore impossible to claim originality for any of the earliest known writings. Yet the continuity of reports about certain plants and their medicinal value makes the conclusion very likely that a large proportion of them was known in ancient times and only through successive mention in the records of the following generations escaped oblivion.

II

Dragendorff, a keen student of medicinal plants during the latter part of the 19th century, pointed out that one of the most interesting phenomena in recorded drug lore is the use

of related plants for identical purposes in geographically widely separated areas (2). This implies the conclusion that whenever individuals or populations migrated into different regions, they found substitutes for the plant remedies they had known in their former homelands. It also suggests that new drug plants were added continuously during the history of man. One of the most recent occurrences of this nature is the substitution of new drugs for old remedies by European immigrants to North and South America. In most of these cases the substitutes were plants of the same families or genera which had a morphological resemblance to the plants that they replaced. This was not true, however, in all instances in which new remedies were used. Here, a merging of old Indian plant lore with that of European origin must be assumed.

The merging of plant lores in areas where new settlers appeared is one of the factors that obscure the origin of drugs. These settlers brought their old lore and acquired some from the native people. "Plant lore centers" appear to be scattered all over the world. The lore originating in each of these centers necessarily deals with plants native to the area. The centers may be extensive, but on occasion they are narrowly confined. The environmental conditions which favor the occurrence of certain plants are often highly specific, and ecological boundaries may therefore coincide with plant lore centers. Also, well-kept family or tribal secrets may account for the localization of certain lore about the medicinal value of a plant.

Many plant families and genera are characterized by similar or identical chemical constituents (3). It is therefore quite understandable that different plant species may serve the same medicinal purpose. But how the therapeutic effects of different carriers of the same active principle could be discovered under widely different conditions is one of the profound puzzles of plant lore. In South America and in China,

for instance, different species of the genus *Smilax* are used for the same purpose (2). European folklore lists remedies in cases where the Mahuna tribe of Indians of Southern California (4) uses identical or related plants. One of them is *Marrubium vulgare*, a member of the family *Labiatae*, which is known to contain a variety of terpenes; others belong to the genus *Spiraea*, well-known carriers of salicylates and essential oils; still another is *Capsella Bursa-pastoris*, the Shepherd's Purse, known in both lores as a superior remedy of diarrheas. Examples of such coincidences can be selected randomly; they are known for all plant lore centers in great numbers. They prove that human curiosity succeeded anywhere in finding relief from distress on a strictly empirical basis. Until the advent of modern medical knowledge, based on physiological and biochemical understanding of diseases that led to the science of pathology, all findings of this nature must be considered to have been empirical.

III

Even though it is not possible to date approximately the origin of plant remedies in many of the existing lore centers, it can be done for a limited number of them. The plant remedies of China are, to a great extent, compiled in the classical herbal *Pen-ts'ao kang-mu* by Li Shih-chen (5). This comparatively recent work—it was finished in 1597—takes much of its information from sources which are almost 4000 years older. Ancient Chinese literature ascribes the earliest attempts to collect and classify plants as remedies to a mythical figure named Shen-nung who is supposed to have lived about 2700 B.C. Whether or not this is correct, it is indicative of the approximate age of agricultural and related activities in China, and it agrees well with what is known about the development of East Asian civilization. Shen-nung's herbal, called *Shen-nung pen-ts'ao-ching*, was supposed to be revised and enlarged during the following forty centuries until Li

Shi-chen made his 52-volume compilation summarizing all the knowledge accumulated to that date. This work is not a herbal in the common sense but a pharmacopoeia which lists drugs of mineral and animal as well as of plant origin.

The plant lore of the Middle East can be traced to beginnings at about the same time the first Chinese sources emerged. The early civilizations of Mesopotamia, of the Nile Valley, and of Persia date at least as far back and may have produced knowledge about plant remedies. Like the *Pen-ts'ao kang-mu*, the *Ebers Papyrus* (6) of ancient Egypt, which describes more than 700 herbal remedies, is a compilation of information that had been handed down to that time. The remarkable fact about the *Ebers Papyrus*, which was discovered during the 19th century, is that it dates from approximately the 16th century B.C., while the *Peng-ts'ao kang-mu* was published more than 3000 years later. In spite of the age of the *Ebers Papyrus*, it is believed that much older medical lore underlies it.

The assumption of such an early origin of human interest in plants and plant remedies is based on logical conclusion, even though recorded proof is lacking. Many of the human endeavors during early millenia and centuries have been recorded in a more or less crude manner, and what has been found shows amazing accomplishments of the people of those times. Undoubtedly the use of plants as drugs went hand in hand with the use of plants as food. It is therefore more than likely that some drug lore dates that far back.

There is a compelling reason for assuming that many of the plant drugs now known may be thousands of years old. The number of those which are listed in various herbals is so great that it is unthinkable that their usefulness could have been established within less than the lifetime of several generations in order to become property of the people. The evolution of plant lore is entirely comparable to that of biological entities; in both cases only the fittest have survived.

Medical writers who recorded the use of plants collected and heeded handed-down traditions. They tried them out, but their lives were much too short, their means to investigate for themselves were far too limited to draw conclusions from their own practical experiences. They passed on the information they considered to be worthwhile and weeded out the rest. No doubt many erroneous conclusions have been drawn in the succession of generations, and perhaps recorded; but the bulk of retained plant lore has gone through successive screening and is probably based on repeated successful use.

IV

The periods that followed the oldest records of human interest in plants saw fluctuating cultures and alternation of dark and enlightened eras. Only from time to time were keen minds given the opportunity to apply their superior intellects to the service of mankind. In medical plant lore the highlights on this road toward knowledge are the writings of those whose names have been retained, partly because of their eminence, partly perhaps because of the fortunate circumstances that favored their activities and allowed the survival of their memory. Names like Hippocrates (460-361 B.C.), Theophrastus (377-285 B.C.), Krateuas (1st century B.C.), Dioscorides (1st century A.D.), and Galen (103-193 A.D.) mark the Greek-Roman era of enlightenment; those of Rhazes (866-925 A.D.), Avicenna (980-1036 A.D.), and Abd-Allah ibn Al-Baitar (13th century A.D.) the one of Arabic prominence (7). Western compilations, written in England, Spain, France, Germany, Italy, Switzerland, Holland, and Belgium, followed in great numbers throughout the middle ages, the renaissance, and modern times, but it is not the purpose of this treatise to enumerate them.

Even a superficial survey of the development of plant lore would not be complete if a very important observation were not added. It refers to the personalities of those who made

the compilations of plant drugs, often called herbals. In ancient history when formal scientific training did not exist, most of the writers on the subject of drug plants were called physicians. The occupation with plants sprang from their interest in the profession of healing. It should be noted that also in subsequent periods, even when medical training was acquired in a formal way, the avocation of botanical studies was most common among physicians. Agnes Arber, in her work on the origin and evolution of herbals (1), mentions that very many of the herbalists of the Renaissance were medical men. This tradition was carried on during the following centuries. It is not generally known that such famous botanists as Nehemiah Grew (1641-1712), Carl Linnaeus (1707-1778), Johann Eschscholtz (1793-1831), John Torrey (1796-1873), and Asa Gray (1810-1888) had doctorates of medicine, and that such famous physicians as Hermann Boerhaave (1668-1738) and John Fothergill (1712-1780) were ardent botanists (8).

If one concedes that many of the plant remedies of the past must have been discovered by persons who were far ahead of their times and their contemporaries and who primarily were keen observers, able to discern causes and effects, one may be inclined to judge the potential merits of these medicines much less harshly than it is often done. After all, they must have helped some people, and though we have no data for comparison, the percentage of efficacy of a plant drug may not have been far different from that which modern drugs show. One must also consider an important factor that is often overlooked, namely the great amount of physiological variability among the members of the species *Homo sapiens*, which has greatly increased by continuous hybridization and mutation over a period of several thousand years. One may assume that plant remedies which had a predictable effect in a more uniform population, may have much less chance when administered to members of a population of greater diversity.

One can even reason that some remedies which were found useful in one racial group may have no effect whatever when used in a population of different origin. An example of the differential response of races is the sensitivity to poison ivy; it is known that individuals from the Far East, especially from China, are scarcely susceptible to the poison of the plant. Another factor is becoming increasingly evident, namely the individual variation in the biochemical makeup of healthy human beings (9). This fact may account for individual drug resistance or drug susceptibility at a level hardly understood only a few decades ago.

V

The accomplishments of drug discovery in the past are the more admirable, since the science of medicine as we know it today is barely more than a century old. Even within this century many of the greatest strides were concentrated in a short few decades. Behind the healers of the past, who had to rely on curiosity, intuition, and the ability to observe, there did not stand an army of physiologists and biochemists ready to explain and predict causes and effects.

At the present time only a small percentage of the drugs that were discovered long ago and used in folk medicine has found recognition. The potent pharmacological effects of morphine, colchicine, the digitalis glycosides, quinine, atropine, and a few others were difficult to overlook. A host of less conspicuous substances is still awaiting recognition. An analogy may be permitted here. Fifty years ago, next to nothing was known about the vitamins with which we are so familiar today. Although the term was coined in 1911, none of them had been identified. Yet folk medicine had used sources of vitamins for centuries as remedies of diseases which are now known to be vitamin deficiencies. The list of vitamins has grown steadily since the time when the identity of the first one was established. There is little doubt that it will

continue to grow. The pace cannot be predicted; but no scientist will ever dare to state that the list is complete. Similarly we do know some constituents of drug plants and their action. An overwhelmingly larger number of plants has been used as remedies. Even if one considers that fallacies and errors may have led to the selection of many a plant, the number of potential drugs is so great that the failures hardly matter.

This discussion does not so much intend to stress the accomplishments of the past as to point out the possibilities of the future. Its primary purpose is to inform that folklore knows a prodigious number of drug plants which are consistently considered to be useless because casual administration has not shown the effects claimed for them; and that there are others which have never even been tried out in modern times, either because the lore about them was disregarded as unreliable or because it was entirely overlooked.

Its secondary purpose is to direct attention to the attitude of drawing a line between the past centuries when it was proper—because it was necessary—to recognize and record lore about plants, and our own time when we can seemingly dispense with such a “primitive” activity.

The final purpose is to show the connections between the past and the present, and to offer proof that the empirical findings of ancient times reveal an intuitive knowledge that may be difficult to explain but is easy to underestimate.

The most logical approach to a revival of drug plant studies is to establish respectability for the findings of the past. The few examples of commonly accepted and used plant drugs do not accomplish this. Only by showing that far more plants mentioned in drug lore actually contain substances with biological activity can further investigation be encouraged. Correlation of folklore therapy with verified therapeutic properties of plant constituents is the most convincing way of reviving interest in old drug plants and perhaps the greatest stimulus for continued search.

VI

Since 1946 joint work at Michigan State University and the Michigan Department of Health has produced an extensive survey in which a large number of plants listed as folk remedies in various herbals was found to contain antibacterial substances (3).

Winter and Willeke (10), in Germany, chose a list of plants from the latter part of the 16th century in order to investigate the reliability of old sources. They used Matthiolus' "*Kreuterbuch*"¹ and selected a group of plants recommended against urinary and wound infections. Comparing the percentage of antibacterial preparations obtained in random tests of several modern investigators with the percentage resulting from testing the plants recommended by Matthiolus, they found that 28.6 percent of the randomly selected plants yielded antibacterial extracts whereas the drug plants listed by Matthiolus yielded 65 percent.

These findings are not fortuitous. It has been pointed out that folklore had to rely on empiricism. The only criteria for the action of drugs were those which observation of the patient could reveal: that his subjective condition improved; that his fever subsided; that conspicuous symptoms disappeared. It can be taken for granted that at times when sanitation was non-existent or poor, bacterial diseases were among the most common afflictions. Even within the 20th century we have experienced a drastic decline in the incidence of infectious diseases in countries with the most advanced sanitary standards. It is understandable that at times when diseases caused by bacteria were prevalent, antibacterial remedies were of great importance.

The antibacterial properties of plant materials do not prove the therapeutic value of their sources. But if folklore has listed a plant endowed with such properties as a remedy

¹ Apparently a later edition (1611) was used than the one originally prepared in 1586 by Joachim Camerarius who died 1598.

for an ailment caused by bacteria, the conclusion is obvious and perhaps permissible.

Antibacterial (and also antifungal) properties of plant materials can be easily shown by available laboratory techniques. More elaborate procedures are required to prove other properties which may be correlated with therapeutic efficacy. Many of the biological actions involved may be indirect and mediated by a number of consecutive physiological responses; their elucidation may take time. Others are more direct and therefore more easily traced.

VII

Among the most interesting drugs are the ones which were reputed to be effective against cancer. Tumor-inhibitory properties of several plant materials have been shown during the past decade. A broad survey made at the National Cancer Institute in recent years (11, 12) has uncovered the presence of tumor inhibitors in a number of plants which were mentioned in early herbals and in folk medicine as remedies against tumors. Again, it appears most unlikely that these coincidences are chance occurrences. They appear even less so as some of the early observations were made in widely separated parts of the world (13).

Tumor-inhibiting properties of a plant were also reported by Dragendorff (2). He cites an old Russian folklore which originated in the province of Olonyets in northwestern Russia. It refers to the abortive fruiting bodies of a fungus that parasitizes birch trees. The fungus has been identified as *Inonotus obliquus*.² Extracts of these abortive forms are supposed to be a remedy for cancer. It is interesting that results obtained in animal tests made by a Michigan State University research group in collaboration with the Sloan-Kettering Institute for Cancer Research in 1955 and 1956 agree with

² Occasionally the synonyms *Phellinus igniarius*, *f. sterilis*, and *Xanthochrous nigricans* are used. Dragendorff calls it *Polyporus annosus* Fr.

similar experimentation reported from Russia (14); the area of consensus is primarily in the finding that tumor inhibition was observed only when extracts were made by prolonged heating of the material. It must be noted that the folklore pertaining to this plant prescribes that the drug be taken in the form of a "tea," that is as a decoction, not as an infusion.

Another folklore dealing with a fungus as tumor antagonist was found in a strictly localized area of the Bohemian Forest as recently as 1934 (15). This lore pointed out one species, identified as *Boletus edulis*, among a number of species of the same genus (as for instance *B. scaber*, *B. rufus*, and *B. badius*), as the one whose regular intake allegedly prevents cancer. All species named grow in abundance in the same localities and are collected in large quantities by the inhabitants of the mountain villages of the border region of Bavaria and Bohemia. They are dried and sold through dealers; many tons of the dried mushrooms, often mixtures of these species, are exported, and quite a few go to the United States. They are also staple food of the villagers who are careful to keep the batches of pure "Steinpilz" for their own use; since this species is superior in flavor to the others, the choice is understandable. In spite of the similarity of the species and the fact that all are edible, *B. edulis* is the only one to which medicinal properties are ascribed. Studies at Michigan State University made in collaboration with the Sloan-Kettering Institute for Cancer Research have completely confirmed that of all *Boletus* species obtained from that area *B. edulis* was the only one which yielded a substance that inhibited implanted animal tumors (16).

VIII

Recent publication of work done at the University of Michigan in collaboration with Michigan State University revealed most interesting findings regarding virus-inhibiting proper-

ties of plant materials (17). They furnish a possible basis for interpretation of the therapeutic effect of some folk remedies which so far remain unexplained. Many virus diseases have been known for a long time and have been thoroughly studied; but a host of unexplored afflictions exists that could be virus-induced. The greatest progress in virus research is rather recent and primarily due to newly developed culture methods. In an editorial introducing a symposium on viruses which was published recently (18), Walter Alvarez stated that he was much impressed by the fact that, at last, virologists could recognize and name many infections which had been considered to be non-specific. Expressing hope for future quick recognition of more and more virus-caused diseases and an increasing number of identifications, he remarked that there would be "fewer nameless fevers and exanthemas." To this one might add that perhaps there will also be more knowledge about the role that viruses may play in the etiology of many other types of ailments whose causes are still unknown. Folklore primarily described symptoms of diseases; in the light of modern research many of the symptoms once combated by plant remedies could fit now known afflictions in which the implication of viruses is shown.

One of the drug plants consistently mentioned in folklore for thousands of years is St. John's wort (*Hypericum perforatum*). The Latin designation "Hypericum" or its Greek equivalent "Hypereikon" has repeatedly been interpreted to indicate the power of the drug (e.g. "hyper" = above, beyond; "eikon" = image, representation), although a less enthusiastic explanation derives the constituents of the generic name from "hypo" = under, beneath, and "ereike" = heath, referring to one of the habitats. Neither interpretation may be correct, since Arabic-Persian authors mention a plant by the name of "hinfarikun," while other Arabic sources speak of "hujufarigum" (2); the origin of the word could therefore be much older. An intriguing possibility is that these terms

could be distortions of the original Greek word, which by way of Syriac versions of Greek writings was translated into Arabic and Persian at the time of Alexander the Great (1) and later appeared in the modified form in retranslations.

This plant is of special interest because of the variety of uses for which it was recommended. Some of the popular terms indicate the esteem that the herb enjoyed. Folklore in various parts of German-speaking areas call it either "Hexenkraut," "Jagdenteufel," or "Teufelsflucht." References can be found here and there stating that the plant drives out witches; this led people in some parts of Europe to hang up dried plants in front of their houses as a protection against evil spirits. This type of lore, although generally applicable to disease (as caused by evil spirits), often points specifically to mental disease. And it is interesting in this respect that a substance isolated from species of *Hypericum* and belonging to the "extended quinones" has been reported to be useful in the management of nervous conditions and depressive states (19).

This plant and other species of the genus contain one of the most potent antibacterial principles known to occur in higher plants (20); it is of added interest that in other studies mentioned (17) an antiviral principle distinctly different from the antibacterial substance was found in *Hypericum* species. The plant has been recommended as a remedy for a variety of diseases: liver and kidney ailments; circulatory disturbances; gout; diarrhea; hemorrhages; bronchitis; bed wetting; and nervous headache. External application has been said to cure lumbago, sciatica, gout, and burns. Certainly the great number of recommendations would prompt many physicians and biologists to dismiss such a panacea as useless. The possibility, however, that the three principles mentioned could account, separately as well as in combination, for the effectiveness in many of the complaints cautions against rash judgment.

For millenia the curative effects of edible plants of the genus *Allium* (onion, garlic, and related species) have been praised in folklore and the writings of medical botanists. Several modern studies have shown that in addition to highly antibacterial substances in garlic (21, 22) there exist principles which are potential tumor inhibitors (23). Finally—to match the case of the St. John's wort—an antiviral activity was discovered in one of the *Allium* species (17). Again, interaction as well as separate action of these factors could explain many of the reputed cures.

IX

More examples of recent proof that biologically active substances are present in plants which folklore records as remedies could be cited. The list is growing continuously and its compilation may lead to a modern herbal with biochemical, physiological, and pharmacological foundations. It is hardly necessary to say that the field under discussion is of enormous breadth and depth. The potentialities are indicated by an interesting fact: in Dragendorff's book (2), which is a collection of plant lore of the world, about 12,700 species are listed. Even if one assumes that some plants were confused with others, and that therefore an overlapping of references may have occurred, one may consider 10,000 as a workable figure. Making the very conservative estimate that only one percent of these plants have sufficient value to be considered as sources of drugs, one arrives at one hundred. Compared with the mere dozen or so of well-established and indispensable plant drugs of today this looks like a fairly impressive figure.

But if one considers the possibility of adding to the existing information about drug plants, of showing perhaps that many of our food plants may in reality be drug plants when eaten with any regularity, the task ahead becomes far greater and more rewarding than the mere attempt to confirm what men have surmised thousands of years ago.

REFERENCES

1. Agnes Arber. *Herbals: Their Origin and Evolution. A Chapter in the History of Botany 1470-1670* (Cambridge: University Press, 1953).
2. G. Dragendorff. *Die Heilpflanzen der verschiedenen Voelker und Zeiten, Ihre Anwendung, wesentlichen Bestandtheile und Geschichte* (Stuttgart, 1898).
3. R. Y. Gottshall et al. *J. Clin. Investig.*, **28**, 920 (1949).
4. J. B. Romero. *The Botanical Lore of the California Indians* (New York: Vantage Press, 1954).
5. A. Mosig and G. Schramm. *Der Arzneipflanzen-und Drogenschatz Chinas und die Bedeutung des Pen-Ts'ao Kang-Mu als Standardwerk der Chinesischen Materia Medica*. Beihefte der Pharmazie, Heft 4 (Berlin: VEB Verlag Volk und Gesundheit, 1955).
6. B. Ebbell (Transl.). *Papyrus Ebers* (London, 1937).
7. T. I. Williams. *Drugs from Plants* (London, 1947).
8. H. A. Kelly. *Some American Medical Botanists* (New York, 1929).
9. R. J. Williams. *Biochemical Individuality* (New York: John Wiley & Sons, 1956).
10. A. Winter and L. Willeke. *Naturwissenschaften*, **40**, 247 (1953).
11. M. Belkin et al. *J. Nat. Cancer Inst.*, **13**, 139, 741 (1952); *Ibid.*, **13**, 889 (1953); *Ibid.*, **14**, 607 (1953).
12. Dorothea B. Fitzgerald et al. *J. Nat. Cancer Inst.*, **13**, 895 (1953).
13. ———. *Ibid.*, **20**, 763 (1958).
14. P. A. Iakimov et al. *Vestnik Akademii Nauk SSSR*, **27**, 88 (1957).
15. E. H. Lucas. Personal observation.
16. ——— et al. *Antibiotics and Chemotherapy*, **7**, 1 (1957).
17. K. W. Cochran and E. H. Lucas. *Antibiotics Annual 1958/1959*.
18. J. T. Syverton, ed. Symposium: "Viruses," *Modern Medicine*, **26**, 71 (1958).
19. K. Daniel. *Klin. Wochenschrift*, **29**, 260 (1951).
20. G. G. Dull. Thesis for the degree of Ph.D., Michigan State University, 1956.
21. C. J. Cavallito et al. *J. Am. Chem. Soc.*, **66**, 1950 (1944).
22. A. Stoll and E. Seebeck. *Helv. Chim. Acta*, **31**, 189 (1948).
23. A. S. Weisberger and J. Pensky. *Science*, **126**, 1112 (1957).

THE LANGUAGE OF MEN

Elizabeth Nitchie

"LANGUAGE, COLOUR, FORM, and religious and civil habits of action," wrote Shelley in his *Defence of Poetry*, "are all the instruments and materials of poetry. . . . But poetry in a more restricted sense expresses those arrangements of language, and especially metrical language, which are created by that imperial faculty, whose throne is curtained within the invisible nature of man. And this springs from the nature itself of language, which is a more direct representation of the actions and passions of our internal being . . . than colour, form, or motion, and is more plastic and obedient to the control of that faculty of which it is the creation. For language is arbitrarily produced by the imagination, and has relation to thoughts alone."

"Arrangements of language"—but what manner of language? A simple answer cannot be given because all kinds of language have been used in poetry: the elevated and the low, the learned and the illiterate, the elaborate and the simple, the esoteric and the familiar. Critical judgment as to what the nature of poetic language should be has varied from one extreme to the other, depending largely on what the critic considers the nature of poetry itself to be. Aristotle finds a place for strange and "foreign" words in verse, because poetry is removed from common life. Wordsworth argues that "there neither is, nor can be, any *essential* difference between the language of prose and metrical composition," because, at least in the poems he is writing in the *Lyrical Ballads*, he has chosen as his subject humble and rustic life and is using "the real language of men." Mr. Cleanth Brooks defines the language of poetry as the language of paradox, because paradox

underlies the true poem. There have been numerous revolutions and counterrevolutions in practice as well as in theory: from the elevated language of Aeschylus to the more familiar words of "Euripides the human," from the formality of the no-longer-living Latin of the Middle Ages to Dante's "illustrious vernacular," from the conceits of the 17th century to the neo-classical reasonable speech, from the artificialities and the "gaudy and inane phraseology" of the 18th-century poets and poetasters to Wordsworth's "language of men," from the elaborate music of the Victorian period to the stripped diction of the 20th century. William Butler Yeats reflected this last reaction in his own poetic career, shedding the embroidered coat of his early verse to "walk naked."

I

Of the kinds of language used in poetry, that which is elevated, figurative, symbolic, melodious, rhythmic poses few problems of definition and identification. The need, of course, is to distinguish the genuine from the false. But when this is done, recognition of the poetic quality almost inevitably follows. But what of familiar language, language common to most men, simple, ordinary words, words and phrases that we have often heard and used, that in themselves demand no special knowledge, even no unusual imaginative powers, for comprehension? If the ways in which such language is used in poetry are studied, they may lead to a conception of the nature of poetic language of any kind. What then is this familiar language? Does it include simple statement and intellectual comment? Does it even include colloquialisms, clichés, and other well-worn counters such as familiar quotations? If so, how is this language made poetic?

Archibald MacLeish once said in a lecture that poetic language translates the abstract into the concrete—that it is concrete language. This is a useful proposition. Its converse, of course, is not universally true: concrete language is not al-

ways poetic. Dr. Johnson's parody of verse written in simple diction is concrete enough:

I put my hat upon my head
And walked into the Strand,
And there I met another man
Whose hat was in his hand.

In comparing it with a stanza from the "Babes in the Wood," Wordsworth says in his 1800 "Preface" that although in both "the words, and the order of the words, in no respect differ from the most unimpassioned conversation," the difference lies in the matter expressed, which, in Dr. Johnson's lines, "is neither interesting in itself nor can *lead* to anything interesting." Yet a statement may at once be interesting or lead to something interesting and be expressed in language that is familiar and concrete, and still not be poetic. Wordsworth's own poetry yields examples. In "The Thorn" not even the pathos of the grave of Martha Ray's baby or the dramatic propriety of the speech of the narrator, that postulated credulous and talkative sea-captain, can make us feel as poetic the lines:

I've measured it from side to side;
'Tis three feet long, and two feet wide.

So the question still remains: how can language that does not "differ from the most unimpassioned conversation" be made poetic?

Wordsworth, to do him justice, offers us also many examples of this possibility. The simple statement, made up of words that are in everyone's vocabulary, may seem on the surface to be his "matter-of-fact" rather than poetry. Yet there are such passages—sometimes single lines—that are exciting, stirring that bodily tension or tremor that A. E. Housman says is the true test of poetry; stimulating the senses, the emotions, and the mind; bringing, in Coleridge's phrase, "the whole soul of man into activity." The words that have

such power make real and concrete, especially in their context, a moving idea or situation.

In "Michael" there is a line which has been called the most poetic in a poem that contains some of Wordsworth's most imaginative imagery. Why does the simple statement that after his son's defection Michael often sat by the unfinished sheepfold "And never lifted up a single stone," equal or perhaps surpass in poetic power the significant picture of Michael:

he had been alone
Amid the heart of many thousand mists,
That came to him, and left him, on the heights?

The realization of Michael's old right hand, like that of Keats's Saturn after his kingdom fell, lying "nerveless, listless, dead," gathers into one gesture, or rather lack of gesture, the whole of his tragedy. The sheepfold, begun by father and son, the symbol of their love and their tie to the land which was to have been Luke's inheritance, can never be finished. And this quiet, motionless grief is more poignant than any violent expression of it could be: it is the extreme grief of the man known for his physical strength and vigorous activity. His neighbors chose this detail to make real his hopelessness. His passiveness is a prophecy of the time when his cottage is gone and "the ploughshare has been through the ground / On which it stood," when all is quiet and dead.

In thinking of the poetic quality of the simple statement, one turns naturally from Wordsworth to Robert Frost, who follows the injunction that he is said to have given to his pupils and has written uncommonly of common experience. It is not his language that is uncommon, but his use of it. No one who has heard him read "The Pasture" can forget the pause and the slight shift of tone in the last line of each stanza: "I shan't be gone long. You come too." The title of the poem may be "The Pasture," but the scene is surely a

farmhouse kitchen, and the poem is about the rich, comfortable companionship of the man and woman who stand there, actual to our sight though there is no description of them. Moreover, these people have a significance not confined to the kitchen in which they stand. They might be Warren and Mary from "The Death of the Hired Man"—true. But they might also be Darby and Joan, or Philemon and Baucis, or any man and wife whose love means the sharing of common experience.

No individual word in these lines is in itself concrete, yet together and in their position in the poem, after the concreteness of the preceding lines, they create reality. The language of the whole poem could not be more simple and familiar. The visual images too are simple and familiar. Any farmer would go out to clean the pasture spring; any farmer would fetch the little calf. But only Robert Frost, farmer and poet, would make of these familiar acts symbols of clarity of vision and warmth of affection, and bind them together by the repetition of the fourth line. The poem truly, in the poet's own words, begins in delight and ends in wisdom, "in a clarification of life."

Frost's "Dust of Snow," except for the metaphor in the phrase that becomes the title (and how familiar that metaphor is, how often is one's coat "dusted, or powdered, with snow"), is also a simple statement, a single, unpunctuated sentence:

The way a crow
Shook down on me
The dust of snow
From a hemlock tree

Has given my heart
A change of mood
And saved some part
Of a day I had rued.

The crow is no Wordsworthian bird teaching the poet a lesson. Like all Frost's "natural objects" (to use Wordsworth's phrase), as in "Two Look at Two" or "Come In," for example, he leads his own bird life, and it is only as the poet feels the *way* his alighting or his flight shook down the snow from the hemlock branch that his life impinges at all upon that of the human being. Yet that universal parallelism is there. Frost tells us so in the simplest yet the most significant way. The words, except two, are monosyllables. The essential ones in the first quatrain—*crow*, *shook*, *snow*, *hemlock tree*—are concrete, familiar words, creating familiar images, sharply colored in black, white, and green; those in the second quatrain are abstract. In these last resides the wisdom of the poem; in all the words resides the delight. And wisdom and delight are joined in the final word, *rued*, the only word which may be said not to be in common use. As Aristotle wrote, the single uncommon word lifts the whole out of the common. It is so charged with meaning that it sets up a tension between the day which the poet had wished to wipe out of existence and the part of that day saved by the simple, unintentional act of the crow, between his two contrasted moods.

Wordsworth too achieves a striking effect by a single unusual word in a poem that to many appears un-Wordsworthian. The last of the Lucy poems, "A slumber did my spirit seal," seems to deny the existence of a spirit in Nature that can minister to man's grief. The second stanza is a stark statement of the finality of Lucy's death and burial: the human body becomes only another fragment of unfeeling, impersonal nature. Lucy's body and the earth revolve endlessly in the simple diction of the last line: a preposition, three concrete nouns, and two conjunctions, the commas and the first *and* setting the whole in circular motion. But into the series of simple, familiar nouns and verbs comes the not-so-familiar adjective:

No motion has she now, no force;
She neither hears nor sees;
Rolled round in earth's diurnal course,
With rocks, and stones, and trees.

Lifted by the word *diurnal*, used chiefly in astronomy, Lucy's death and the poet's grief belong to the universe.

II

Wordsworth and Frost, in the examples given, are writing chiefly in the language of the common man—Wordsworth's rustics, with little or no assistance from education or sophistication. What of the familiar language of the more cultured and sophisticated? Coleridge devoted the nineteenth and part of the twentieth chapters of his *Biographia Literaria* to this question. Suggesting that it is what Wordsworth really had in mind when he spoke of the language of men, he says that English poetry has always been characterized by the "strange and curious phaenomenon" that the German critic Garve noted in his comments on Gellert's poetry—"verses in which everything was expressed just as one would wish to talk, and yet all dignified, attractive, and interesting." Coleridge finds this quality in the poetry of his contemporaries, naming Moore, Byron, Southey, Bowles, and Wordsworth himself, and in older poets: Herbert, Cotton, Waller, Spenser, and Chaucer. "What," he asks, "could we hear more natural, or more seemingly unstudied" than certain stanzas from *Troilus and Criseide*?

The dramatic appropriateness of the language of what Coleridge calls "the perfect well-bred gentleman" is clear enough in Chaucer's narrative poem or, to take a modern instance, in the verse plays of Mr. T. S. Eliot, from the polite badinage of the opening of *The Cocktail Party*, for example, to Reilly's professional explanations to Celia and finally to his interpretation of her death:

So it was obvious
 That here was a woman under sentence of death.
 That was her destiny. The only question
 Then was, what sort of death? *I* could not know;
 Because it was for her to choose the way of life
 To lead to death, and, without knowing the end
 Yet choose the form of death. We know the death she chose.
 I did not know that she would die in this way,
She did not know. So all that I could do
 Was to direct her in the way of preparation.
 That way, which she accepted, led to this death.
 And if that is not a happy death, what death is happy?

This is the language that the psychiatrist might use in talking with Celia's friends. Yet it is poetry not only by reason of its dramatic propriety or its revelation of the meaning of the play, but by reason of its very language, especially the repetitions, in a varying prosodic pattern, of the key words. *Way, lead, choose, know, death*—they are all simple monosyllables, not concrete, but rich with implications and connotations. *Death* weaves its way through the lines—there are only four which do not contain it or its variant *die*—to emerge in the quiet triumph of the final chiasmus: "And if that is not a happy death, what death is happy?"

The use of the conversational tone in lyric poetry poses a more difficult problem. I find it hard to justify Mr. Eliot's own shift, in *East Coker*, from the strange imagery that opens the second movement to the matter-of-fact: "That was a way of putting it—not very satisfactory." Yet the poet's "intolerable wrestle / With words and meanings" sometimes produces language which seems completely natural and unstudied and also truly poetic. Coleridge says that the reader would find this true of Chaucer's verse if he would adopt "the pronunciation of the poet and of the court, at which he lived." Just so, I suspect, we should find the manner of expression as well as the sound of many older poets. The poems of John Donne are written in the language of the educated

man of the early 17th century, and when we understand the then current meanings of words and the significance of certain contemporary ideas and terms, we admit the naturalness of his language. But not even this historical sense is needed to recognize the poetic force of the first line of "The Canonization": "For God's sake, hold thy tongue, and let me love." This explosion of temper startles the reader into attention, the more so because the colloquialism, "hold thy tongue," is still part of his common vocabulary. He half expects the familiar sequence, "and let me speak." His surprise brings him immediately to a sure sense of what the poet is talking about.

III

The shock of the unexpected is often what stabs the reader awake to the imaginative significance of familiar language. It is not only "the sure return of still expected rhymes" that threatens him with sleep: it is the foreseen completion of a familiar phrase or the stodgy, conventional context of common words in which they become blank counters, they say nothing to us. E. E. Cummings discovered a delightful way to make simple words shed their triteness. His talent for dislocating the conventional syntax of common parts of speech makes enchanting some of his seemingly unintelligible stanzas:

anyone lived in a pretty how town
(with up so floating many bells down)
spring summer autumn winter
he sang his didn't he danced his did.

By other twists and turns of language a poet can take even a cliché or a trite familiar quotation and make it fresh and new. He can do what Agnes de Mille said that S. J. Perelman did in conversation: "There was always an appropriate cliché which could be rubbed up and have its neck screwed

around." The origin of the cliché is, paradoxically enough, in the initial brilliance of the phrase which through long misuse has lost that brilliance. Some began in the salty, often metaphorical speech of everyday living. Many started life as lines or phrases from great poetry, so striking that they caught the attention and remained in the memory. (We remember the story of the man who, having seen his first Shakespeare play, deplored the poverty of the dramatist who had to use so many familiar quotations.) Such brilliant passages—images, comparisons, metaphors—when paid the tribute of repetition and imitation may, of course, continue to carry with them all the first suggestiveness and in new contexts may even acquire added richness. More often, however, they are used mechanically and inappropriately, with little or no suggestion of the original context. Yeats, in his poem, "A Coat," tells us what happened to his early poetry:

I made my song a coat
Covered with embroideries
Out of old mythologies
From heel to throat;
But the fools caught it,
Wore it in the world's eyes
As though they'd wrought it.
Song, let them take it,
For there's more enterprise
In walking naked.

When fools catch it, the poet—and the reader—may well decide that the old expression must be discarded.

The cliché, indeed, in both prose and verse has long been a favorite target for critics. John Ciardi, writing in the *Saturday Review* for March 30, 1957, branded its use as the deadliest manifestation of the deadliest sin against poetry, Acedia or sloth. This is certainly true when the cliché is the result, as he says, of a versifier's "failure to pay enough attention." But when it is the result of attention and intention on

the part of a poet, it may be even a virtue. The poet may well give the trite expression a fresh setting that will renew, even though it somewhat modifies, the former brilliance. The cliché then becomes a poetic, not a blank counter.

Some poets use the cliché or the familiar quotation for the purpose of satire. E. E. Cummings, wishing to burlesque the writers and readers of stereotyped verse, mingles slang, advertising slogans, snatches of popular patriotic songs, and sentimentalized clichés and trite quotations in the lines from "Poem, or Beauty Hurts Mr. Vinal":

. (Case in point

if we are to believe these gently O sweetly
melancholy trillers amid the thrillers
these crepuscular violinists among my and your
skyscrapers—Helen & Cleopatra were Just Too Lovely,
The Snail's On The Thorn enter Morn and God's
In His andsoforth

do you get me?) according
to such supposedly indigenous
throstles Art is O World O Life
a formula:example, Turn Your Shirttails Into
Drawers and If It Isn't An Eastman It Isn't A
Kodak therefore my friends let
us now sing each and all fortissimo A-
mer
i

ca, I
love,
You.

Archibald MacLeish, in "Memorial Rain," pits the platitudes of the Armistice Day orator against the tragedy of the young man fallen in war in a foreign land. Echoing Rupert Brooke (whose sonnet, though not great, was in its time deeply moving), the orator

Indicates the flag
Which (may he say) enisles in Flanders plain
This little field these happy, happy dead
Have made America . . .

The last lines of the poem, in the simplest of words, speak the unsentimental truth: after the rain begins and scatters the living audience to their homes,

The earth relaxes, loosens; he is sleeping,
He rests, he is quiet, he sleeps in a strange land.

IV

Perhaps the most interesting intentional use of the trite and the familiar is to be found in the poetry of Dylan Thomas. He does not use it for satire: he uses it because he sees in it expressive possibilities. The original sharpness of the phrase before it was worn smooth by use, and its new brightness in a strange setting together impress the reader with its truth and validity: "High and dry by the top of the mast," "snow on the tip of the tongue of the year," "And surely he sails like the ship shape clouds," in which the double meaning catches the imagination. His devices are so various and so effective that it is worth while to examine them in some detail. He assuredly rubs the cliché up and twists its neck around.

Thomas waited until his command of language was sure before he dared to make poetic use of the trite comparison. In his later poems there are many examples. And the trite simile is bare and clear, used boldly, with no apologies, with evident intent. Yet its surroundings are unusual enough to make the reader weigh its meaning. In "The Ballad of the Long-Legged Bait" the contrast between light and darkness, as well as the metaphor of movement (itself something of a cliché), is strengthened by the unconventional use of the conventional simile:

Sails drank the wind, and white as milk
He sped into the drinking dark.

In "A Winter's Tale" the transformation wrought by the snow is stressed by the image of purity in the familiar Biblical comparison set against the symbol of impurity: "And the dung hills white as wool." In this poem there is another simile that slips easily from the tongue, "and he ran like a wind after the kindling flight," and yet not so easily after all, for the altered article, *a* instead of *the*, catches and holds it for the reader to examine. In "Ceremony after a Fire Raid" the soaring natural sweetness that was the initial significance of the now trite "to sing like a bird" returns to enrich the concept of life growing out of death in the lines:

And the dust shall sing like a bird
As the grains blow, as your death grows, through
our heart.

All such comparisons the textbooks tell our young writers to avoid—I had almost written, *like the plague*. But of course there are few Dylan Thomases who can, often by the simplest of deviations, restore brightness to the worn, rubbed figure. The removal of a single word can make all the difference: "Though they be mad and dead as [door] nails."

Sometimes Thomas changes slightly other familiar phrases or proverbial expressions. "Once below a time," "all the sun long," "fall awake"—why not? "Grief thief of time"—as good a thief as procrastination, surely. The long-legged bait "nipped and dived in the nick of love"; the atlas-eater Cerberus in the first *Altarwise* sonnet has not a nose but a "jaw for news"; in his "Prologue" the author is

Eternal waters away
From the cities of nine
Day's night

instead of wonder. The thirty-year-old poet remembers walking with his mother

Through the parables
Of sun light
And the legends of the green chapels
And the twice told fields of infancy.

“And death shall have no dominion” for

Though they be mad and dead as nails,
Heads of the characters hammer through daisies

—here he suggests the colloquial euphemism, “push up the daisies,” but changes the verb to the powerful “hammer through”—coming strangely enough after the “nails” in the preceding line—to prove the dominion of life, not death.

One of the most unusual devices that Thomas employs is the breaking up of a compound word, the parts of which often change their syntactical and logical relationships: "Blood shot and scattered to the winds of light," "the prayer wheeling moon," "winding-footed in their shawl and sheet." Or he may take a familiar quotation and redistribute its parts in an even more complicated pattern:

Grief with drenched book and candle christens the
cherub time
From the emerald, still bell.

My camel's eyes will needle through the shroud.

In such passages the familiar quotation slips out of its place in *Bartlett's*. There is a new and startling kind of allusion or echo, serving not only to extend and enrich the meaning but also to make the reader think twice: once about the original, once about the echo—and the sum is often three or even four. Richer still is the Biblical echo which is far more than an echo in the lines from "Over Sir John's Hill":

God in his whirlwind silence save, who marks the sparrows
hail,
For their soul's song.

The reminder of Elijah's stern, mystical experience on Horeb combines with that of Jesus's words about the all-seeing eye and the all-embracing kindness of God: the word *hail* means both the movement of the sparrows' fall and the cry for mercy of the "led-astray birds"—or humans.

V

In all these ways even the most common and the most trite language can be made poetic. It is not, of course, the only language for poetry: Wordsworth's phrase, "the real language of men," always raises the question, what men? There is room for the elevated and elaborate diction of the immortals of Aeschylus or Milton, even for the artificial speech of Pope's artificial shepherds, who quite naturally would talk not of their sheep but of their fleecy care. We must, indeed, be cautious about branding language as too elevated or too mean for poetry. For there are changes in the use and meaning of words. Some have come down in the world: in Elizabethan times the Christ Child with all reverence could be called a "silly imp," for the words meant "innocent child." And the same word that seems too mean or vulgar in one age may be the respectable language of men in another: Dr. Johnson, commenting in a *Rambler* paper on the lines from *Macbeth* beginning, "Come, thick night! / And pall thee in the dunnest smoke of hell," laid himself open to modern scorn by questioning the words *dun*, *knife*, and *blanket* as having been "debased by vulgar mouths" and so spoiling the poetic effect by suggesting unpleasing or even ludicrous images.

There have always been poets and critics who have walked in the middle of the road. Even Wordsworth said that the language of men must be purified from "all lasting and rational causes of dislike or disgust." Aristotle declared that the

Through the parables
Of sun light
And the legends of the green chapels
And the twice told fields of infancy.

“And death shall have no dominion” for

Though they be mad and dead as nails,
Heads of the characters hammer through daisies

—here he suggests the colloquial euphemism, “push up the daisies,” but changes the verb to the powerful “hammer through”—coming strangely enough after the “nails” in the preceding line—to prove the dominion of life, not death.

One of the most unusual devices that Thomas employs is the breaking up of a compound word, the parts of which often change their syntactical and logical relationships: "Blood shot and scattered to the winds of light," "the prayer wheeling moon," "winding-footed in their shawl and sheet." Or he may take a familiar quotation and redistribute its parts in an even more complicated pattern:

Grief with drenched book and candle christens the
cherub time
From the emerald, still bell.

My camel's eyes will needle through the shroud.

In such passages the familiar quotation slips out of its place in *Bartlett's*. There is a new and startling kind of allusion or echo, serving not only to extend and enrich the meaning but also to make the reader think twice: once about the original, once about the echo—and the sum is often three or even four. Richer still is the Biblical echo which is far more than an echo in the lines from "Over Sir John's Hill":

God in his whirlwind silence save, who marks the sparrows
hail,
For their soul's song.

The reminder of Elijah's stern, mystical experience on Horeb combines with that of Jesus's words about the all-seeing eye and the all-embracing kindness of God: the word *hail* means both the movement of the sparrows' fall and the cry for mercy of the "led-astray birds"—or humans.

V

In all these ways even the most common and the most trite language can be made poetic. It is not, of course, the only language for poetry: Wordsworth's phrase, "the real language of men," always raises the question, what men? There is room for the elevated and elaborate diction of the immortals of Aeschylus or Milton, even for the artificial speech of Pope's artificial shepherds, who quite naturally would talk not of their sheep but of their fleecy care. We must, indeed, be cautious about branding language as too elevated or too mean for poetry. For there are changes in the use and meaning of words. Some have come down in the world: in Elizabethan times the Christ Child with all reverence could be called a "silly imp," for the words meant "innocent child." And the same word that seems too mean or vulgar in one age may be the respectable language of men in another: Dr. Johnson, commenting in a *Rambler* paper on the lines from *Macbeth* beginning, "Come, thick night! / And pall thee in the dunnest smoke of hell," laid himself open to modern scorn by questioning the words *dun*, *knife*, and *blanket* as having been "debased by vulgar mouths" and so spoiling the poetic effect by suggesting unpleasing or even ludicrous images.

There have always been poets and critics who have walked in the middle of the road. Even Wordsworth said that the language of men must be purified from "all lasting and rational causes of dislike or disgust." Aristotle declared that the

"perfection of style is to be clear without being mean." Pope, in the *Essay on Criticism*, gives his advice about the use of archaisms and neologisms:

In words, as fashions, the same rule will hold,
Alike fantastic, if too new or old:
Be not the first by whom the new are tried,
Nor yet the last to lay the old aside.

T. S. Eliot speaks for the 20th century in the lines from *Little Gidding*:

And every phrase
And sentence that is right (where every word is at home,
Taking its place to support the others,
The word neither diffident nor ostentatious,
An easy commerce of the old and the new,
The common word exact without vulgarity,
The formal word precise but not pedantic,
The complete consort dancing together) . . .

"The complete consort"—here is really the final answer to the question of what makes language, language of any kind, poetic. The word *context*, expressed or implied, has been prominent in this paper. What makes the phrase or the sentence or the single word "right" for poetry is its right association with all the other phrases or sentences or words. It may quietly take its place in a harmonious whole; it may surprise the reader by contrast or a sudden turn; it may gather into itself the whole meaning of the poem. That whole context, of course, must in itself be imaginative, be poetic. Perhaps this is begging the question; but the problem of what makes subject matter poetic belongs to another paper. Whatever the context may be, the language of poetry always becomes part of a pattern, an "arrangement." The poet is the choreographer who makes his words "dance together."

Acknowledgements

Acknowledgement is made to the following publishers and agents who have granted permission to reprint selections from copyrighted publications.

Harcourt, Brace and Company

For *Poem, Or Beauty Hurts Mr. Vinal*, copyright, 1926, by Horace Liveright; renewed, 1953, by E. E. Cummings. Reprinted from *Poems 1923-1954* by E. E. Cummings by permission of Harcourt, Brace and Company, Inc.

For "East Coker" and "Little Gidding," from *Four Quartets*, copyright, 1943, by T. S. Eliot. Reprinted by permission of Harcourt, Brace and Company, Inc.

For "The Cocktail Party," from *The Cocktail Party*, copyright, 1950, by T. S. Eliot. Reprinted by permission of Harcourt, Brace and Company, Inc.

Henry Holt and Company, Inc.

For Robert Frost, "Dust of Snow" and "The Pasture," from *Complete Poems of Robert Frost*. Copyright, 1923, 1949, by Henry Holt and Company, Inc. Copyright, 1951, by Robert Frost. Reprinted by permission of the publishers.

Houghton Mifflin Company

For Archibald MacLeish, "Memorial Rain," *The Collected Poems of Archibald MacLeish 1917-1952* (Boston: Houghton Mifflin, 1952). Reprinted by permission of Houghton Mifflin Company.

The Macmillan Company

For William Butler Yeats, "A Coat," *Collected Poems*, 2nd ed. (New York: Macmillan, 1951). Reprinted by permission of The Macmillan Company.

Harold Ober Associates

For quotations from Dylan Thomas, *Collected Poems* (New York: New Directions, 1953). Reprinted by permission of Harold Ober Associates, agents in America for the Dylan Thomas estate.

SOURCES OF VALUE IN POETRY

A primer for relativists

Oscar Mandel

I. Aesthetic Value and Total Value

IN RECENT YEARS, critics of poetry have sought, implicitly or explicitly, to locate the value of poetry within a certain area of "purity." Carefully detaching the poem from its historical and biographical context, they allow it to have value only as a self-existent object, like a sudden vase standing alone in a white room. Its appeal lies in its logic, the sharpness of its imagery, its rhythm, its sounds, its tone, and its intellectual tensions and complexities, especially as these are implied rather than exhibited by the poet. The poem, they say, is not a manifesto, not a sermon, not a psychological exhibit, not a lecture about the world; it is a poem; and just as we do not ask of a political speech whether its caesurae are appealing, so we do not inquire of a poem whether its doctrine is virtuous. Nor do we bring to bear on it any information which is not requested by the poem itself. If Keats writes about green meadows, we can rely on the steady opinion in our culture that green meadows are attractive—even if Keats does not say that they are attractive; but the fact that he died at the age of twenty-six has nothing to do with our feelings about the poem.

If we ask what lies at the center of this New Criticism, I believe the answer must be its attempt to turn aesthetics into a legitimate—that is, a timeless—science. By freeing itself from the shifting grounds of history, psychology, politics, moral doctrine, or theology; and by removing elements like biography or reputation from its discussions, criticism seeks,

as does pure science, to obtain both a stable object and a stable subject. For example, our opinion of fallen women has changed perceptibly since the days of *David Copperfield*, and evaluations of art which depended on a "sound" view of such matters have become useless. But a crisp bundle of consonants or a modification of an archetypal motif remains as certainly a crisp bundle of consonants or a modification of an archetypal motif as the speed of light stays at 186,000 miles per second.

Plausible as this method seems, our comment might well be that of Ruskin's on a theory of political economy which by-passes value judgments: "I do not deny the truth of this theory: I simply deny its applicability to the present phase of the world." It is, in his words, like "a science of gymnastics which assumed that men had no skeletons." The trouble, then, with this attempt to lift aesthetics from the embarrassing agitations of psychology and history to the minute certainty of pure science is that *it no longer accounts for the object in a way which can completely interest a mortal reader*. When it has exhausted its analysis of the work of art, it has left out of account elements which may be essential to the reader's appreciation, and this on the arid grounds that, first, such elements belong to other branches of inquiry, and second, they are shifting matters of taste. The reader is left in the unhappy position of a man who, inquiring whether a sauce is likely to give him indigestion, is informed of its chemical formula. This information has its own interest, but it hardly answers his question.

Thus, the full account of value in poetry (and in any art except perhaps music) cannot be limited to timeless factors and unanimity. The object cries for escape. Our reader's response to the poem has as a matter of simple fact been radically modified by non-aesthetic motives (in Ruskin's analogy, chemically rather than arithmetically). The critic whose explanations ignore these motives does not satisfy an

actual reader; he satisfies a reader of his own invention. If the value of poetry is defined as the profit and enjoyment it gives the reader, the true business of the aesthete is to record patiently and faithfully what the sources of profit and enjoyment actually are. His grammar of art is descriptive, not prescriptive.

It may be useful, at this point, to state the four axioms concerning experience which will govern what follows:

First, that the full value of a poem—its *total* capacity for giving profit and enjoyment—consists in more than its aesthetic value.

Second, that even aesthetic value is affected and “chemically” modified by non-aesthetic factors.

Third, that literary criticism should deal with full rather than segregated value.

Fourth, that literary criticism is based on a generalized, but not a perennial, subject.

A question immediately arises: should the critic who involves the poem in non-aesthetic values include in his discourse any and every possible species of value? In the first place, I believe he is quite justified in occupying himself with only one or two values, provided he is clear about the possible incompleteness of his analysis. In the second place, however—and this is our next subject—he may omit altogether from his discourse the idiosyncratic sources of pleasure. But he omits them, not because they are “illegitimate” or “impure,” but because discourse about them is not useful.

For example, if a man likes a poem because his grandfather once chatted with the poet in a club, we cannot deny that the poem has a value for him. Granted that his pleasure is not derived from the text—any poem by the same poet would please him; yet it is the poem which awakens his pleasure; he enjoys the poem. If he enjoys it, not because “the meadow was a carpet green” strikes him as a delightful image, but because the poet might have read this very line to his grand-

father at the club, it is not for the aesthetician to grumble; he need only record the fact that the pleasure derived from a work of art can have odd sources. He may of course label one pleasure "aesthetic" and the other something else, but this does not outlaw the other pleasure. The real reason for eliminating the odd pleasure is that oddity in this case is unimportant. Since very few readers will have had grandfathers who spoke with the same poet in or out of the club, we simply leave this reader to his pleasure without further comment, recollecting only that we all have our idiosyncratic pleasures which cannot be communicated to others.

Not all idiosyncratic responses are as trivial as this anecdotal species. But it must be recognized that just as a million dollars in gold loses its value on a desert island, so a poem may collapse before an upset stomach, or be exalted by the voice of the poet reading it aloud. Some people who will admit the dependence of value on historical shifts of taste may find a similar dependence on upset stomachs too ludicrous to admit. Yet the principle is the same. We eliminate the upset stomachs from our discourse only because they are (we hope) ephemeral and peculiar. And we pity the dyspeptic individual whose constitution makes him permanently unable to receive art, and whom aestheticians omit from their books altogether.

If the value of a work of art consisted simply in its "pure" intrinsic elements on the one side and idiosyncratic "impurities" on the other, aesthetic discourse could dispense with the latter and return to tensions, ironies, levels of meaning, and ambivalences. But many extrinsic values, though unstable, are as much a part of the common cultural stock as is our appreciation of images and ironies. To enjoy a poem because, say, it procured the liberty of certain prisoners, is quite another matter than enjoying it because our grandfather knew the author. The two examples have much in common, yet one is only a peculiarity while the other may belong to all.

The profit and enjoyment a reader obtains from a poem, therefore, stem *partly* from elements which (1) are peculiar to poetry and (2) are timelessly communicable because they can depend on a stable subject; and *partly* from elements which (1) are not peculiar to poetry and (2) change according to the individual reader. Clearly, reception of full value—the spontaneous or reflective discovery of profit and enjoyment—involves a complex psychological act, an act which is done a patent injustice when the stable elements alone are analyzed. This partial analysis is at worst a kind of non-Euclidean geometry, a game with only a marginal relevance to the human experience of art. Aesthetics, therefore, must obey the workings of the mind confronting the poem, and if the mind shifts its sails, the aesthetician must follow. The artist has every right to dehumanize his art. But the critic who dehumanizes criticism for the sake of stability robs it of reality. By trying to be true to an ageless realm, he is in fact false to every age.

What are the main sources of poetic value which have traditionally existed as a matter of psychological fact? We are not concerned here with the *nature* of this value—for example, whether “profit and enjoyment” consists in Emotion, Attitude, Belief, or Experience; or in what way aesthetic pleasure is different from the pleasure we obtain from a new refrigerator. The terms we use—profit and enjoyment—are purposely left undefined, and the reader may substitute his own, or eliminate either word altogether; for, again, our concern is only with the elements which create value, rather than with the nature of the value thus created. It goes without saying that the term *profit* is used here in its spiritual sense, though without a further distinction between moral and intellectual.¹

¹ Profit can also be therapeutic. Aristotle's catharsis is Hellenic mental hygiene. Perhaps the same can be said about I. A. Richards' mental equilibrium. And we have Mill's testimony as to the actual medicinal effect of Wordsworth's poetry.

These main sources may be broadly divided into (1) idiosyncratic value and (2) general value. Under both of these, value is either intrinsic or extrinsic. Of idiosyncratic value we have already spoken; it remains therefore to list and discuss the values which history warrants as general, if not universal. Such a list is made possible by the relative stability of the race, or at least of our civilization. No source of value is excluded if it generally exists, because no source of value can be legislated out of existence. While pursuing this division between intrinsic and extrinsic value, we should remember at every point that, in the first place, the human experience is an integrated one, and, in the second place, that the two values are not always distinguishable even in theory. One further note: for the term "extrinsic," I will occasionally substitute the term "phenomenal," because "extrinsic" seems faintly pejorative. The phenomenal value of poetry is, then, the profit and enjoyment we derive from the poem as an event with a past and a future, a cause and an effect, a root in the poet's and the culture's history, and fruit in its effect on other men and other events.

II. General Intrinsic Value

The intrinsic value of a poem includes first of all the various elements (already mentioned) which modern criticism has analyzed with particular clarity. Because so much has been written on this subject, we need only take note of these elements: imagery, rhythm, sound; internal logic; relationship among the several parts of the poem; depth of meaning of individual words and phrases. All these constitute without doubt the central features of what we call poetry. The poem which appeals in every other regard except this one may have considerable value for some people, but it is unlikely to survive long in the estimation of many. It is no small merit of 20th-century criticism that it has focused its attention so

firmly on this complicated nucleus.² Still, when we speak of these intrinsic values of poetry, we must not forget that they too depend, as values, on a stock of common experiences and common emotions which are not themselves created by the poem in question. The "biological" basis of sound and imagery is nothing compared to their cultural basis. What is the value of "My love is like a red, red rose" if the rose happens to be a symbol of stupidity in a certain country at a certain time? What we call the *true* appreciation of poetry in terms of these intrinsic characteristics requires not the blank mind of a timeless reader, but the matured mind of a sophisticated member of what sociologists call an in-group.

But the intrinsic merit of a work of art does not lie only in the formal elements which, as we have seen, are peculiar to poetry and scrutinized by the stable, permanent subject—the sharpness of an image, the repetition of a word, a calculated brevity, a paradox, or the conquest of an ironic opposition. Another source of intrinsic merit derives from the fact that the poem expresses ideas of good and evil, and thus arouses our own moral dispositions. These dispositions are no longer peculiar to poetry, nor, though they are far from idiosyncratic, are they fixed in time or space. For all that, a full account of a work of art must take them in, even at the risk of becoming useless in another culture, or to another generation.

The moral element may interfere with the intrinsic value of a poem at any level: the single image, a statement, or the theme itself. For the most part, we are not aware of a moral response while the images of a poem play upon our emotions. Let us consider a few images at random. Tennyson's sensuousness in

All night have the roses heard
The flute, violin, bassoon;

² One supposes that, because of the New Criticism, the day is gone forever when a critic like Arnold could *prove* the superiority of the *Iliad* over the *Chanson de Roland* by doing nothing more troublesome than quoting three or four lines of each.

All night has the casement jessamine stirred
 To the dancers dancing in tune;
 Till a silence fell with the waking bird,
 And a hush with the setting moon.

The expression of the mysterious, the long past, and the far away, in "Far on the ringing plains of windy Troy," or in Yeats'

For Fergus rules the brazen cars,
 And rules the shadows of the wood,
 And the white breast of the dim sea
 And all dishevelled wandering stars.

Blake's expression of innocent joy:

And I made a rural pen,
 And I stain'd the water clear,
 And I wrote my happy songs
 Every child may joy to hear.

Or Herbert's tenderness:

Love took my hand, and smiling did reply,
 Who made the eyes but I?

Or Hopkins' reverence:

Because the Holy Ghost over the bent
 World broods with warm breast and with ah! bright wings.

Or the majestic and heroic of Milton's

Up he rode
 Follow'd with acclamation and the sound
 Symphonious of ten thousand Harps that tun'd
 Angelic harmonies: the Earth, the Air
 Resounded, (thou remember'st, for thou heards't)
 The Heav'ns and all the Constellations rung,
 The Planets in their stations list'ning stood,
 While the bright Pomp ascended jubilant.

So far we are morally unruffled, and we allow our aesthetically sensitive selves the pleasure and the profit of these "harmless" images and the thousand and one other devices with which the poets charm us. When the poet calls up images of dejection, fear, disgust, and the like, we follow him, as in Eliot:

I am aware of the damp souls of housemaids
Sprouting despondently at area gates.

Or Vergil's

As in our dreams at night-time
When sleep weighs down our eyes, we seem to be running,
Or trying to run, and cannot, and we falter,
Sick in our failure, and the tongue is thick
And the words we try to utter come to nothing.³

Or Baudelaire's

The flies buzzed over that putrid belly
Out of which came black battalions
Of worms,

Or Eliot again: "A washed-out smallpox cracks her face."

In these cases, the poets disapprove or dislike, and we approve of their disapproval and we dislike what they dislike. Our moral sense, which appears to have nothing to do with the value of all these images, in reality only seems quiescent. It moves, as it were, at the same velocity as the author's, and as a result we fail to perceive any motion at all. To the extent that we enter into the reverence, the tenderness, the disgust of our poets, we in effect approve of them, and allow our aesthetic selves the freedom of the place. In reality, of course, we may dislike bassoons, think the Holy Ghost a childish superstition, and happy songs for children a bore;

³ Rolfe Humphries' translation.

yet such is the Orphic power of poetry that, as Coleridge pointed out, we *usually* yield to its values.

But not always. Suddenly we read a line which is not only unacceptable, but morally obnoxious. Two moral sensibilities—the poet's and ours—fly asunder. Trained though we may be in tolerance and detachment and aesthetic purity, we reject the line or the poem with invincible disgust. And we discover what, after so many centuries, we should be ashamed to have to discover anew: that although the separation between the moral and the aesthetic faculties can be made by discourse, it is not a psychological fact. Examples are not too useful here, because moral sensitivity differs from person to person, country to country, and age to age. Only the principle is steady. The best that can be done is to offer illustrations relevant to the writer himself. From Cummings, for example,

a kike is the most dangerous
machine as yet invented
by even yankee ingenu
ity (out of a jew a few
dead dollars and some twisted laws)
it comes both prigged and canted.

I find, too, that my endurance for obscenity has limits. I accept Baudelaire's "Charogne" and Yeats' splendid "But Love has pitched his mansion in / The place of excrement." But the following item from Mr. Allen Ginsberg's now notorious "Howl" does not turn me against the miserable world, but against Mr. Ginsberg:

who copulated ecstatic and insatiate with a bottle of beer
a sweetheart a package of cigarettes a candle and fell off
the bed, and continued along the floor and down the hall
and ended fainting on the wall with a vision of ultimate

c . . . [the dots, for some reason, are Mr. Ginsberg's] and came eluding the last gyzym of consciousness.⁴

Moral shock is more likely to occur over contemporary than over ancient works of art, for even when the general subject matter is the same (e.g., incest, murder, antisemitism), its appearance in modern trappings and in familiar everyday garb induces us to participate more actively. Then, too, we are more ready to forgive an author of the past because of the allowances we make for his "circumstances," and because time itself seems to mollify us. Nevertheless, we need only Shylock to remind us that even three or four centuries may be insufficient to wipe out an offense. Many Jews still boggle at the play; others are willing to recollect that antisemitism in 16th-century England (a country at that time virtually without Jews) was not the sign of spiritual infamy that it is in our time. Once again, this is not a field for aesthetic legislation. Moral sensibilities may be changed by education, but not by critical fiat.

The literature of an alien culture may be fertile in moral outrages to our own. A possible illustration is Calderón's *El Medico de su honra*, a poetic drama which, incidentally, bears a curious resemblance not only to *Othello*, but also to *Measure for Measure*. The hero, Don Gutierre, suspects his wife, Doña Mencia, of infidelity. The evidence is strong, yet the audience knows that Doña Mencia is innocent. Don Gutierre has his wife bled to death by a leech. The king arrives on the scene. He knows that Don Gutierre has committed the murder, and he knows too that Doña Mencia was chaste. Don Gutierre tells the king that a bandage came off and that his wife died by accident. The king, however, reveals his own knowledge. Perhaps, remembering *Othello*, we expect at this point despair in Don Gutierre, punishment by the king,

⁴ It is a characteristic of modern literature that the writer often demeans himself in order to exhibit the meanness of the world. Dante roamed in Hell as an outsider—in fact, as a client of Paradise. Nowadays the damned are described by the damned.

lament over Doña Mencía. By no means: the king congratulates Don Gutierre for taking care of his honor, and on the very scene of the murder offers him the hand of Doña Leonor, whom Gutierre had jilted in favor of Doña Mencía. Don Gutierre amiably warns her that his hand is still red with blood, and that he has not forgotten the art of healing his honor. She declares herself willing to be butchered if suspicion touches her, and upon these terms Don Gutierre consents to marry her. Poor Doña Mencía does not even get a sigh. The moral is that a suspicion of jealousy, if it is strong enough, justifies murder. Whether the Anglo-Saxon (or the Christian) reader can "accept" such a play will depend, again, on his sensitivity, his bias, and his ability or inability to suspend his own morality.

Moral opposition to the poet does not perforce weaken the poem, nor, if it does, need this weakening be fatal. The reading of Milton's Satan as the true hero of the poem would have seemed odious to the poet, but this disagreement did not alienate the misreaders—they merely relished the epic on their own terms. The controversy about Satan, however, led to the neglect of what appears to this reader a more important issue, to wit, whether the last two books do not arouse in us emotions quite the contrary of those which Milton intended. The history of mankind, as foretold by Michael, is meant to reconcile us to God—indeed, to make us adore Him for His infinite goodness and mercy—and to restore our peace of mind in the manner of Greek tragedy. But willing as I am to suspend my opinions in most situations, the imposition practiced on me in these two books irritates and alienates me. While Adam is made to sing hosannah, we are confronted with a cruel God permitting a lugubrious pageant of history to develop under the guise of His justice. The more Milton pulls in one direction—the assertion of the triumph of the perfect God—the more does the very material which he presents through Michael convince us of the utter

victory of Satan. The figure of Adam becomes ludicrous. Each time he sees land, Michael disillusions him: more bloodshed, more vice is to come, time trails new horrors in. By every dramatic principle, Adam ought to be left sobbing his soul out; instead, Milton makes him grateful.

Again, these particular examples are private; they merely show at what point in one reader moral condemnation can lead to aesthetic rejection. In such cases, the reader, instead of disliking what the poet dislikes, dislikes the poem and, if his revulsion is great enough, the poet into the bargain.

The appreciation or depreciation of a poem is a spontaneous act of the total mind. Rigorous training might teach us to repress the interference of our moral sense in aesthetic judgment, just as it could conceivably teach us to regard, say, sensuous beauty as an irrelevance in poetry—to notice its presence but disallow the caress. And again, the moral factor might be eliminated by sheer neutrality and indifference. Whether this is a desirable condition for mankind is not a question pertinent at this point. Only the fact must be recorded here—namely, that pure, blank readers are still rare.

Thus "The Hound of Heaven" is more than an example of how "a poem may shift from image to image without confusion"—it expresses a way of life which may be repugnant or attractive to us. A poem like "Ulysses" is not a mere collection of images and rhythms, but a moral directive: greatness is

To follow knowledge like a sinking star,
Beyond the utmost bound of human thought.

This moral statement is not simply *used* by the poet (as Yeats is sometimes said to have exploited his "philosophy" because it supplied him with interesting images); it has a value and a power of its own, independent of the manner in which it is expressed. For the moral sense does not come into play only in cases of revulsion. Insensibly, we discover a greater value

in works of art "on our side" of any question which interests us, and are neutral only when we are indifferent. We are not surprised, and do not think it heretical, that Mr. Eliot, for example, seems to like Johnson and Kipling a little better because he is in moral harmony with them.

For the aesthetic law which rules that "the morality of an image, a statement, or a theme is not relevant to the intrinsic value of a poem," let us substitute the truer law, "the more sensitive to moral issues we are, the more does the value of a poem depend on its moral content." Such a law includes the graduate student who knows that the poem does not *mean*, it only *is*; and it includes that sublime crank, Tolstoy, who damned nearly everybody from Sophocles to Wagner for their wickedness. And it includes the Marxist critic, because political involvement is really a branch of morality. The reader who feels that as a moral agent he dislikes what a poem says, but as a critic of poetry he admires and loves it, is not as moral as he thinks, or else his moral objection happens to be so slight in the particular case that he hardly feels it. But few people have actually constrained themselves to the strange rigors of absolute aesthetic purity.

The discussion so far has dealt with the moral problems raised by the text itself. Condemnation of the text may well justify condemnation of the poet, but if condemnation of the poet for what we happen to know about his life and opinions precedes our reading of the text, and colors a text which contains nothing reprehensible in itself, we pass from the intrinsic value of the poem to its phenomenal life.

Not only morality, but the intellectual level of a poem is an element of its intrinsic value. We accept a trifling, humorous poem, but we do not accept a stupid poem. Here too, of course, illustrations are hazardous, and they are offered as one man's opinion. Tennyson, a victim of the keepsake style even in his maturity, yields some unsavory examples. His "the little port / Had seldom seen a costlier funeral," which

ends *Enoch Arden*, is notorious; but most of his long narratives suffer from stupidity. Here are four lines from another poem of his 1864 volume:

Your ringlets, your ringlets,
That look so golden-gay,
If you will give me one, but one,
To kiss it night and day,

etc. More recently, we have had from Ezra Pound an abundance of nonsense like "Pétain defended Verdun while Blum / was defending a bidet," which might be humorous in a humorous context, but in a serious context is not even excused by the plea of insanity. Verlaine, in his religious phase, gave us

Je ne veux plus penser qu'à ma mère Marie,
Siège de la sagesse et source de pardons,
Mère de France aussi de qui nous attendons
Inébranlablement l'honneur de la patrie.

Going back a few centuries, one may find it difficult to repress laughter over certain solemn passages in Camoëns' *Lusiads*. In the second canto, an East African king addresses Vasco da Gama, who has just discovered him, with allusions from the *Odyssey*. In the same canto, Bacchus disguises himself as a Christian priest in what is now Kenya, and plots with the Moslems to attack the Portuguese. When Venus saves the latter, da Gama addresses a prayer of thanksgiving to Divine Providence, which Jupiter answers by soberly promising him conquest over the "idolatrous heathens." In the tenth canto, the Ptolemaic universe, with its true saints in the Emyrean, is disclosed to da Gama by Tethys, who, perhaps to forestall his surprise, assures him that she is a figment of man's imagination. In short, Camoëns failed to integrate past with present, pagan with Christian, West with East, or his

own desire to exhibit his learning (or his wish to be "in the tradition") with poetic demands. The consequence of this intellectual absurdity in Camoëns is an intrinsic failure in the poem which "pure" poetic merit cannot redeem.

Absurdity aside, we must distinguish between important and unimportant ideas *qua* ideas. While it is true that we do not in general turn to poetry to increase our stock of concepts, we still demand that the concepts which interest the poet have an intellectual standing conformable to the tone of the poem and to our notions of intellectual decorum. Considered outside the poems themselves, the idea of *Paradise Lost* is greater than the idea of Crabbe's *Village*; and Keats' *Ode to Autumn*, though perfect in its type, has always and justly been subordinated to the more famous odes to the urn and the nightingale, whose subject matter is more sublime. Certain ideas or situations are incapable of yielding the greatest poetry; others appear to have a permanent interest to the human race. Obviously, it is difficult to separate this intellectual interest completely from the moral interest we have already discussed; but it can be said that, when the thesis of a poem has been passed by the moral censor in ourselves, it must still pass the test of intelligence, and finally it must exhibit its sheer, intrinsic power to move us. The perennial themes which circle about the facts of death and love are not made significant by their being embodied in fine poems; they are significant in themselves. That is why it is easier to write a good poem about the fear of death than about a balanced diet. Thus Hopkins' "all / Life death does end and each day dies with sleep" can easily be discussed in terms of its extremely original technique, and its idea could be dismissed as a "mere" element. Yet if we preserve the technique and change the idea: "all / Strife dinner ends and each dim diner sleeps," we get not only a new poem but a trivial one. True, greatness awaits the confluence of form with content—otherwise anyone with a noble idea could

write a noble poem; but a clown set out in the trappings of a king is still a clown, though a disturbing one.

In discussing the moral and intellectual contents of a poem, I have for simplicity's sake restricted my examples to overt statements. This is far from a derogation of so much current analysis, which demonstrates that the statements of a poem are often less important than what we might call its exhalations. A double meaning in a word, an ironical image, a twist of the rhythm, can sometimes convey an attitude or an idea more powerfully than a plain "The Lord is my shepherd; I shall not want." Moreover, there is the question of relationship between ideas. For example, Mr. Robert Penn Warren objects to hand-me-down ideals or simple ("pure") raptures. An idea, an attitude, must "earn itself" against an opposition; Mercutio supplies the ironic *basso continuo* for Romeo and Juliet. What is really at issue here is intelligence again. Our contempt for the home-sweet-home type of popular verse does not stem, after all, from a hatred of the home and the family, but from an aversion to the simple-minded yessing of a simple-minded, or indeed venal, writer. The modern intelligence tends to demand awareness of the full problem, as reflected not only in bare statement, but in a sophisticated technique. For example, Donne's intelligence, like Dostoevsky's, is of the type which arrives at a conclusion—if it arrives at any conclusion—only after such a lucid examination of the opposite possibility that the latter's power still lingers even after its defeat. This is calculated to appeal to our disenchanted and precise century. Yet surely intelligence is compatible with the Psalmist's kind of straightforward simplicity which is sometimes called sublime. Innocence, too, can be profound, and repose can stir.

Finally, besides the "aesthetic," the moral, and the intellectual values inherent in the poem, we must accept the value which the poem *may* possess as revelation of a personality, or certain aspects of a personality. In the next section we will

speak of the value which is created by impressing on the poem the biographical information we happen to have about the poet. Here, however, we deal with the information as revealed by the poem itself, a revelation not so much of facts as of spirit. Needless to say, the reader is not likely to experience intrinsic biography on the one hand and extrinsic biography on the other. But for our purpose, we may distinguish here the peculiar value which poetry has had for many readers as disclosures of interesting states of mind. To adapt a figure used (and castigated) by C. S. Lewis, the poem is not only a window on the world, it is also a window on the poet, depending on whether we are looking in or looking out; and sometimes the looking in is the more entrancing experience of the two. Much depends on the reader's temperament, and much depends on the nature of the particular poem; but undeniably we may, with certain texts, obtain an overwhelming impression of being spoken to personally by a well-defined character. To take a personal example again—this time in prose, where, of course, the same principle operates—I have obtained my own most vivid sense of being in touch with a person through his work by reading the novels of Fielding. I know little about the man, but I read his novels not only because of what they say, but also because I love the man who is speaking. Whether this response is permissible or forbidden, aesthetic or moral, is of no concern to me. It is a response which, like the more orthodox responses, constitutes value. Conversely, the indirect revelation of a weak or arrogant or servile temperament may well color, or rather discolor, our satisfaction with the work, and turn us against it in spite of our admiration.

III. General Extrinsic Value

The distinction between the intrinsic and extrinsic value of poetry cannot always be made sharply and simply. One of the basic elements in the intrinsic evaluation of a poem lies

in a full understanding of each single word. But now, in order to read a word well, we may find ourselves pushed farther and farther away from the poem, without being able to define the point at which we have left the text proper. At first the difficulty is slight. The intrinsic value of a poem cannot be elicited until we bring to light, out of our own knowledge and experience, all the information which has consciously or unconsciously gone into the making of the poem. In other words, we meet the poem's thoughts with our own. When Herbert says

Sure there was wine
Before my sighs did dry it; there was corn
Before my tears did drown it,

we may legitimately be reminded of the two sacramental objects, which Herbert at this point uses for their pagan connotations, with audacious tentative blasphemy. Our knowledge of the sacrament, or rather our partial definition of bread and wine as objects used in the celebration of the Mass, can still be said to be elicited by the text: we are meeting the poet's information with our own. But when we return to Tennyson's "Far on the ringing plains of windy Troy," our difficulties begin. What is the definition of Troy? At which point do we exhaust the meaning of this word as far as the poem is concerned? We can range from the simplest footnote, "Ancient city in Asia Minor destroyed according to legend by an expedition led by Agamemnon from the Greek mainland and islands" to the most abstruse archaeological evidences, referring to the Hittite empire, and invoking not only Homer but the Homeric cycle and two dozen versions of the same narrative, not to mention a few thousand references to the story in other literary works and depictions in stone and oil. Surely at some point in this process we are leaving the Tennysonian line and bringing in extrinsic knowledge; otherwise no knowledge whatsoever is extrinsic, for it

can be said that every word of the language can be linked to every other word by a shorter or longer process, entirely logical and psychologically plausible: everything is a member of everything. At what point in the associational sequence does a meaning become extra-textual?

This semantic problem is not the only obstacle to a rigorous division between intrinsic and extrinsic elements. But once we are aware of the difficulty, we can safely proceed to an enumeration of the elements which, though they contribute value, are clearly not imbedded in the poems themselves.

The best known is, of course, the biographical element. Its interjection is known nowadays as the "biographical heresy," yet for all that, the simple and irreducible fact is that biographical considerations can afford new profit and new enjoyment in the reading of a text. For the work of art is more than a shape, more even than a moral shape—it is a phenomenon with all the multifarious possibilities of other phenomena. Catullus' Clodia—the "Medea of the Palatine" or "fourpenny Clytemnestra"—Milton's blindness, Rimbaud's affair with Verlaine, all these give an extraordinary interest to a variety of poems. It may be doubted whether anyone can like a poem on biographical grounds when in every other respect he finds it execrable. A relevant biographical fact can, however, render an interesting poem more interesting still, or give an interest to an indifferent poem. According to our premises, this is genuine value: the total value of a poem, we say, includes as one of its possible elements its relation to the life of the author.

The actual experience of pleasure, surprise, awe, or the insight into life which often accompanies the mental act of joining biographical information to the work of art we are contemplating is such a common one, and its fruitfulness and its importance as a human event so well attested in all epochs, that one would hardly feel the need to defend its status were

it not that so many critics today, eager to deal with the text only, and only with what is poetry in the poem, think that they are thus giving a full account of the text. But biography is one of the phenomenal repercussions of the text which irreducibly exist. The air of remoteness from life which we discover in some of our critics, our graduate students, and in many of the contributors to the "little magazines," reflects this separation of the aesthetic from the phenomenal, this modern tendency to make compartments in the mind, to place the poem here and its author there. Yet when a reader refuses to admit the particular charm of a poem which it owes to his knowledge of certain circumstances in the poet's life, he is not very far from performing upon his own soul a kind of mutilation which some saints operated on their bodies, also for the sake of purity.

This is not to say that biographical knowledge yields only a trivial amusement. Facts like the seclusion of Emily Dickinson or the religious insanity of William Cowper endow our reading of certain of their poems with an intellectual richness which is sometimes hard to define without tired metaphors, but which nevertheless we feel with our whole beings. Such poems become, in fact, psychological documents of extraordinary subtlety. Tillyard, for example, speaking of Herrick's poetry, brings in some extrinsic information about the poet's removal from London to a then remote and rustic Devon, and his willingness to make the best of his situation: "It is this personal triumph, this resolute acquiescence in picking and enjoying the restricted range of rosebuds within his reach without wasting his energies in lamenting those beyond it, that give a general significance to his poetry." We are far, at that point, from the gross and statistical caricatures of the textbooks of psychology. We come in touch with life at its most elusive yet its most real; we *come in touch*; here is intimate psychology, the feeling for the one man at the one time. For all the dangers of speculative fantasy which face us at

this game, if we are careful we rise from the experience wiser than before. Nor is this kind of wisdom acquired by mere biography on the one side or the isolated poem on the other. The one and the other have *their* value; this is a third.

Closely associated with biographical information is information concerning other works of the same author. Even purists find it hard to read a poem without infusing into their understanding and pleasure elements which they have obtained from other texts. Many a crux in Yeats' verse is best resolved—one is tempted to say *only* resolved—by marshalling evidence from other poems or from the *Vision*. Let the purists decide whether this is permissible or not. The fact is that the normal reader cannot divest himself of this extrinsic knowledge even if he would. What of the sonnet sequence, or *A Shropshire Lad*? Are all the poems of a series extrinsic to each other, or may the series be looked upon as one greater poem? Arid distinctions, which the humane, conservative reader need not trouble about.

A minor yet instructive and profitable piece of information is the effect which a poem has made on its times, certain individuals, or posterity; or, indeed, its own vicissitudes as an object. It is amusing to read *Lear* with the knowledge that the 18th century performed it with the happy ending of the original story; and Virgil's *Fourth Eclogue* in the light of its Christian interpretation. The tamperings of Emily Dickinson's too serviceable editors, or the malaise of Robert Bridges over the poems of his incommensurably greater friend, give piquancy to these poems—a value which they inherit by accident rather than exhibit by their own structures. Yet we are no more justified in demoting this value to something invidious and irrelevant to the poem than in denying that a man's inherited wealth is as real as that which he acquired by his own labor. At any rate, what concerns us here is the simple psychological fact that this knowledge does give another dimension, albeit a minor one, to the works concerned.

in a full understanding of each single word. But now, in order to read a word well, we may find ourselves pushed farther and farther away from the poem, without being able to define the point at which we have left the text proper. At first the difficulty is slight. The intrinsic value of a poem cannot be elicited until we bring to light, out of our own knowledge and experience, all the information which has consciously or unconsciously gone into the making of the poem. In other words, we meet the poem's thoughts with our own. When Herbert says

Sure there was wine
Before my sighs did dry it; there was corn
Before my tears did drown it,

we may legitimately be reminded of the two sacramental objects, which Herbert at this point uses for their pagan connotations, with audacious tentative blasphemy. Our knowledge of the sacrament, or rather our partial definition of bread and wine as objects used in the celebration of the Mass, can still be said to be elicited by the text: we are meeting the poet's information with our own. But when we return to Tennyson's "Far on the ringing plains of windy Troy," our difficulties begin. What is the definition of Troy? At which point do we exhaust the meaning of this word as far as the poem is concerned? We can range from the simplest footnote, "Ancient city in Asia Minor destroyed according to legend by an expedition led by Agamemnon from the Greek mainland and islands" to the most abstruse archaeological evidences, referring to the Hittite empire, and invoking not only Homer but the Homeric cycle and two dozen versions of the same narrative, not to mention a few thousand references to the story in other literary works and depictions in stone and oil. Surely at some point in this process we are leaving the Tennysonian line and bringing in extrinsic knowledge; otherwise no knowledge whatsoever is extrinsic, for it

can be said that every word of the language can be linked to every other word by a shorter or longer process, entirely logical and psychologically plausible: everything is a member of everything. At what point in the associational sequence does a meaning become extra-textual?

This semantic problem is not the only obstacle to a rigorous division between intrinsic and extrinsic elements. But once we are aware of the difficulty, we can safely proceed to an enumeration of the elements which, though they contribute value, are clearly not imbedded in the poems themselves.

The best known is, of course, the biographical element. Its interjection is known nowadays as the "biographical heresy," yet for all that, the simple and irreducible fact is that biographical considerations can afford new profit and new enjoyment in the reading of a text. For the work of art is more than a shape, more even than a moral shape—it is a phenomenon with all the multifarious possibilities of other phenomena. Catullus' Clodia—the "Medea of the Palatine" or "fourpenny Clytemnestra"—Milton's blindness, Rimbaud's affair with Verlaine, all these give an extraordinary interest to a variety of poems. It may be doubted whether anyone can like a poem on biographical grounds when in every other respect he finds it execrable. A relevant biographical fact can, however, render an interesting poem more interesting still, or give an interest to an indifferent poem. According to our premises, this is genuine value: the total value of a poem, we say, includes as one of its possible elements its relation to the life of the author.

The actual experience of pleasure, surprise, awe, or the insight into life which often accompanies the mental act of joining biographical information to the work of art we are contemplating is such a common one, and its fruitfulness and its importance as a human event so well attested in all epochs, that one would hardly feel the need to defend its status were

it not that so many critics today, eager to deal with the text only, and only with what is poetry in the poem, think that they are thus giving a full account of the text. But biography is one of the phenomenal repercussions of the text which irreducibly exist. The air of remoteness from life which we discover in some of our critics, our graduate students, and in many of the contributors to the "little magazines," reflects this separation of the aesthetic from the phenomenal, this modern tendency to make compartments in the mind, to place the poem here and its author there. Yet when a reader refuses to admit the particular charm of a poem which it owes to his knowledge of certain circumstances in the poet's life, he is not very far from performing upon his own soul a kind of mutilation which some saints operated on their bodies, also for the sake of purity.

This is not to say that biographical knowledge yields only a trivial amusement. Facts like the seclusion of Emily Dickinson or the religious insanity of William Cowper endow our reading of certain of their poems with an intellectual richness which is sometimes hard to define without tired metaphors, but which nevertheless we feel with our whole beings. Such poems become, in fact, psychological documents of extraordinary subtlety. Tillyard, for example, speaking of Herrick's poetry, brings in some extrinsic information about the poet's removal from London to a then remote and rustic Devon, and his willingness to make the best of his situation: "It is this personal triumph, this resolute acquiescence in picking and enjoying the restricted range of rosebuds within his reach without wasting his energies in lamenting those beyond it, that give a general significance to his poetry." We are far, at that point, from the gross and statistical caricatures of the textbooks of psychology. We come in touch with life at its most elusive yet its most real; we *come in touch*; here is intimate psychology, the feeling for the one man at the one time. For all the dangers of speculative fantasy which face us at

this game, if we are careful we rise from the experience wiser than before. Nor is this kind of wisdom acquired by mere biography on the one side or the isolated poem on the other. The one and the other have *their* value; this is a third.

Closely associated with biographical information is information concerning other works of the same author. Even purists find it hard to read a poem without infusing into their understanding and pleasure elements which they have obtained from other texts. Many a crux in Yeats' verse is best resolved—one is tempted to say *only* resolved—by marshalling evidence from other poems or from the *Vision*. Let the purists decide whether this is permissible or not. The fact is that the normal reader cannot divest himself of this extrinsic knowledge even if he would. What of the sonnet sequence, or *A Shropshire Lad*? Are all the poems of a series extrinsic to each other, or may the series be looked upon as one greater poem? Arid distinctions, which the humane, conservative reader need not trouble about.

A minor yet instructive and profitable piece of information is the effect which a poem has made on its times, certain individuals, or posterity; or, indeed, its own vicissitudes as an object. It is amusing to read *Lear* with the knowledge that the 18th century performed it with the happy ending of the original story; and Virgil's *Fourth Eclogue* in the light of its Christian interpretation. The tamperings of Emily Dickinson's too serviceable editors, or the malaise of Robert Bridges over the poems of his incommensurably greater friend, give piquancy to these poems—a value which they inherit by accident rather than exhibit by their own structures. Yet we are no more justified in demoting this value to something invidious and irrelevant to the poem than in denying that a man's inherited wealth is as real as that which he acquired by his own labor. At any rate, what concerns us here is the simple psychological fact that this knowledge does give another dimension, albeit a minor one, to the works concerned.

Similarly, a work of art which caused a conversion, a cure, a revolution, a death interests us for that reason and becomes a significant phenomenon in addition to whatever aesthetic status it possesses.

Far more important is the manner in which the idea of the poem is related to history and to the general history of ideas. Here indeed we stand once more on the tenuous no man's land between intrinsic and phenomenal value. But if we follow the stricter New Critics, we must confess that St. Augustine and Calvin have little or nothing to do with the intrinsic value of *Paradise Lost*. Yet to read the latter without knowledge of, or reference to, the history of religion, the treatment of Christian and pagan myths in other authors, or the politics of England and a dozen other subjects, is to deprive ourselves of a well-attested source of profit and pleasure. *Paradise Lost* is perhaps an extreme example of the usefulness of extrinsic information. A lyric of Herrick's demands less, yet it too may gain (or, to be sure, lose) by a knowledge of the Anacreontic and Elizabethan lyric traditions.

There is no need to multiply instances. The well-stocked mind uses its stock and delights in connecting a poem with events, meanings, ideas, and phenomena extrinsic to the text. We cannot blink the fact, however, that working out a relationship or a similarity of this kind may also impoverish a poem. Sometimes a naive reading is the best.

Historical significance of any kind also operates to give the poem an accidental yet irrefragable value. Matthew Arnold warned against this kind of exaltation: a work of art is not good because it is the only surviving fragment of a vanished civilization, or because it is the first example of a genre or of an attitude. Yet, because the mind refuses to split the object in two halves, one half aesthetic and the other half phenomenal, it continues to find an especial delight in an object because of its advantageous historical situation. Furthermore, we tend to forgive in an ancient work of art crudities or

simplicities which are hard to tolerate in modern works. What we read as wisdom in the Psalms might strike us as blather were it presented as modern work. Willy-nilly, we date what we read before we release ourselves to the text.

A distillation of the aesthetic value of a poem from the historical context implies that literature and, say, pamphleteering are two discrete forms of creation. Yet this is not always the case. Solon wrote politics in verse, and Cicero's pamphlets are conceded to have considerable "literary" interest—yet who would neglect their historical context? Because of its pamphlet qualities, Wordsworth's sonnet *To Toussaint L'Ouverture* can hardly be read without history. Theorists argue in vain about the definition of poetry versus the definition of prose, and they argue in vain about the definition of literary versus non-literary writing, because (as Bergson pointed out in another context) they are trying to foist the geometric shapes of words on the amorphous flux of reality. We begin with white and black; we add gray; and then we find something between gray and white without name, and something else between gray and black without name. A poem is not a literary object and a pamphlet a non-literary object. Reality will not obey our words. In reality, the value of a poem does not reside solely in its literary nature. Nor does our mind experience one satisfaction from ambiguous words and a second satisfaction from an apt recollection of St. Augustine. The value of a poem consists in *all* the satisfactions which it may happen to evoke.

To the categories of biography, effect, and relation to history, we may add one less obvious and more difficult to name. This is the desire to respect and admire the writer. Respect and admiration are usually elicited by the qualities we call "sincerity" and "genius," both of which are naturally found primarily in the poem itself. But they are also suggested by our extrinsic biographical knowledge, and as such they return to bless or plague the text whether or not we like to

admit them. Witness our revulsion against plagiarism. A text which has satisfied us again and again loses its power, and irritates us instead, when we discover that our writer "took it all from someplace else." The Chinese, as we know from their tradition in black-and-white art, entirely lacked this preoccupation with originality, as did, indeed, most medieval artists. This does not mean, however, that they did not wish to see in a work of art evidence of greatness in the artist himself. They thought, rather, that greatness of soul consisted precisely in a loving imitation of some precedent master. Thus, the evidence of greatness may shift, but the desire to be in touch with it is permanent. The man whose Vermeer turns out to be a Van Meegeren is not to blame if his relish for the picture diminishes; nor is it fair to say that he is only bemoaning its market value. The picture looks at him and says, "I am a cheat," and no discourse concerning color, composition, or tension can restore its merit.

Source-hunting, a much ridiculed and often ridiculous pastime, bears at least this much fruit, that it discloses our author's relative authenticity and originality. To find a passage in Shakespeare a mere reproduction of a passage in Holinshed tends to render us indifferent to it, unless we transfer our admiration to Holinshed. But to compare most of his plays with their sources, or to read him after reading his contemporaries, is to make the plays glow in a manner which almost exacts our worship. "He transcended his sources": this fact, though it does not appear from the text itself, cannot be divorced from the value of the work. We admire not only the text as such but the act of transcending. "He followed his source closely": here our pleasure, which might have been great had we remained ignorant, is sharply checked unless the imitated verse is only a small portion of the work, or unless the fact of imitation itself has some point. A step down, and we face plagiarism.

Our study of an author's plans or his revisions may give us

similar rewards. The Cambridge MS of Milton, containing the stages of his thinking about *Paradise Lost*, cannot perhaps add materially to our satisfaction with the epic, yet it enriches our reading with its own mite, not entirely contemptible. But the variorum Dickinson and Yeats pour treasure on treasure. We are source-hunting again, but this time in the writer's own mind. As we read a word and glance at the word which it replaced, we experience again that sense of intimate admiration and that brief perception of the operations of genius; our respect for the poet's mind adds something to the poem to make it greater than itself. It may be objected that this admiration, though it is occasioned by the poem, is not an admiration of the poem; that we experience one pleasure because of the poem, and another pleasure because of our admiration for the poet's cleverness. But inasmuch as we admire this cleverness *in* the poem, we must conclude that the poem is the source of our admiration. Its peculiar value, in such a case, resides not only in what it says and how it says it, but also in how it exhibits the writer's genius.

In the previous section, intrinsic morality was upheld as a factor in creating value. Extrinsic morality must now be added to this, no matter how repugnant the idea may seem to us today. In other words, what we know about the author's character does, as a matter of fact, color our direct appreciation of his works. This was partly revealed in the Ezra Pound controversy in 1948. Four points of view emerged in the attack on Pound. One, that the award of a prize was a political as well as a literary event. This argument is of course outside our scope here. Two, that the poetry was simply bad poetry. This too does not concern us. Three, that the poetry was made bad by its immorality. This argument has been discussed under intrinsic value. Four, that Pound's viciousness and treason made his poetry odious. And this is our subject here.

Again, no prescriptive indignation of the purists can

abolish the sober fact that the art of a person odious to us may lose its value. Ruskin quoted from Rubens' papers to demonstrate the latter's soullessness, which made him reject the paintings *a priori*. Many sincere and honest persons, not all of them Philistines, could not abide the art of ex-Nazis after the war. At a much less vehement pitch, Samuel Johnson, commenting on the insincerity of Cowley's love poems (inasmuch as he had been in love only once in his life "and then never had resolution to tell his passion"), adds, without blinking, "This consideration cannot but abate, in some measure, the reader's esteem for the work and the author." It is said, also, that Trollope's stock tumbled when his *Autobiography* revealed the industrial efficiency of his work. But needless to say, the opposite happens as easily, and we may find ourselves favorably disposed toward an author merely because we sympathize with his views or his person. This is distinguished from the sympathy we have discussed in connection with intrinsic morality. In one case, it is the text which arouses our moral sympathy; in the other it is the author.

To the intrusion of a personal like or dislike for a writer, it can be objected only that it is often idiosyncratic, and therefore useless in a discussion of general principles. In specific cases, too, this extrinsic consideration yields more readily to education (or persuasion) than most. And in fact, at this point it is not easy to distinguish between idiosyncratic and general. We can say only that certain instances of like or dislike—a rival's grudge, a son's admiration—are unmistakably peculiar, while others can be, or are in actuality, widely shared. In either case, however, the real uselessness lies in arguing the irrelevance of such an intrusion.

To conclude what is no doubt an incomplete survey of extrinsic agents of value, we may touch on a source of loss for which the text itself cannot be held responsible, namely the anaesthetic effect of repetition. The obverse is of course

the exciting effect of novelty. When all has been said about the beauty of imagery, the irony, the morality, the historical connections of the poem, the fact remains that its value depends to some extent on whether it is being read for the first, second, or fiftieth time. Unlike the value of money (which is normally constant) or the value of sex and food (which is cyclical), that of the individual work of art is subject to absolute decay. This melancholy event is by no means universal, but neither is it idiosyncratic. In *Swann's Way*, for instance, Proust tells us that the repeated performance of a certain sonata never failed to overpower Swann, partly because of an idiosyncratic association between the music and his mistress. Swann, in spite of his misplaced passion, was an enviable man. Who has not suffered the very different experience of losing contact with a work, of trying desolately to recall the emotion he once felt, of waiting in vain for the *moment* to arrive? Most lovers of art experience this loss, especially scholars, who begin with enthusiasm and by and by become numb to the works they study. For most readers, a reasonably complicated text discloses its value gradually, after two or more readings, until a maximal point is reached, followed by a wane. If we continue to speak of the value of the Fifth Symphony or of *Othello* long after we have become dead to either, it is, on the one hand, because the intellectual portion of value has been assimilated and thus persists (whereas the emotional value has vanished), and, on the other hand, because our critical discussions are based on the remembrance of emotions which, all too often, have been lost to us.

IV. Conclusion

The modern critic does not pretend that the sources of value outside the aesthetic do not, or ought not, to exist. His endeavor, he says, is merely to isolate the pure art-elements in the work of art, and to restrict criticism to what makes litera-

ture literature. Our reply has been that this method is plausible as far as it goes, but that, *because literature is always more than literature*, criticism must eventually come to grips with non-literature too. Every human discipline must study the object as the object presents itself to the human receptor. The poem presents itself as a complicated machinery—a new structure in the world—but also as an interpretation of the world. If the critic does not treat it as such, who will? Other disciplines will occasionally use the poem for an illustration, but they are busy with their own affairs. Only the literary critic, drawing on any relevant discipline, can deal fully with the full text. To be sure, he will be forced to give up the scientific joy of timelessness. But he will stay in touch with reality.

One age stresses the religious importance of art, another the need for formal beauty. Of two epochs which demand morality, one may exact a vision of man's nobility, the other may be content with solid maxims. Of two epochs which demand formal perfection, one may favor harmony of parts, the other tension and paradox. Our own age, grown indifferent, humane, and "understanding," has tended to neglect the moral side of art and to stress craftsmanship; another age will repudiate the cult of form and insist on the worship of whatever it happens to be worshipping. Yet, however the temper of an age may obscure an element, it continues to function—witness the sheer amusement of medieval misercords, or the moral indignation aroused by the Pound case. It is only a question of emphasis or neglect.

What, in the end, is the richest reading of a poem? That which draws only on the knowledge we have of poetics, or that which draws unashamedly on the totality of our experiences—experiences of life and of art—that which, in other words, takes advantage of our growth? The answer is clear. No one is really willing, or even able, to dismiss important faculties and memories which are forcibly evoked by the

work he is reading, even if these faculties and memories are extra-literary. Here more than in economic life, wealth comes to the wealthy. Each experience, itself made meaningful by our past, becomes another condition which the next experience must face in judgment. True, in this way texts which pleased us when we were twenty may look foolish thirty years later. We accept this defeat for the sake of a greater victory. We read a new poem with all lights blazing—not with one or two of our lights, and the others put out by an arbitrary aesthetic legislation. The poem deals with the world, not—omitting exceptions—with literature. It deals with morality, with history, with politics, with metaphysics. Is it any wonder if they, in turn, should deal with it? The Marxist rejecting a poem on the ground of capitalistic tendencies need not apologize to the graduate student at Yale who rejects it because it has no objective correlative.⁵ For the movement of reality is indifferent to aesthetic legislation, and nothing can be done about the sources of value, in the long run, except to describe them.

⁵ We are likely to quarrel with the Marxist, of course, but the quarrel will concern his Marxism, not the aesthetic principle. We are likely, in this country, to isolate him not by means of our purity, but by means of a different morality.